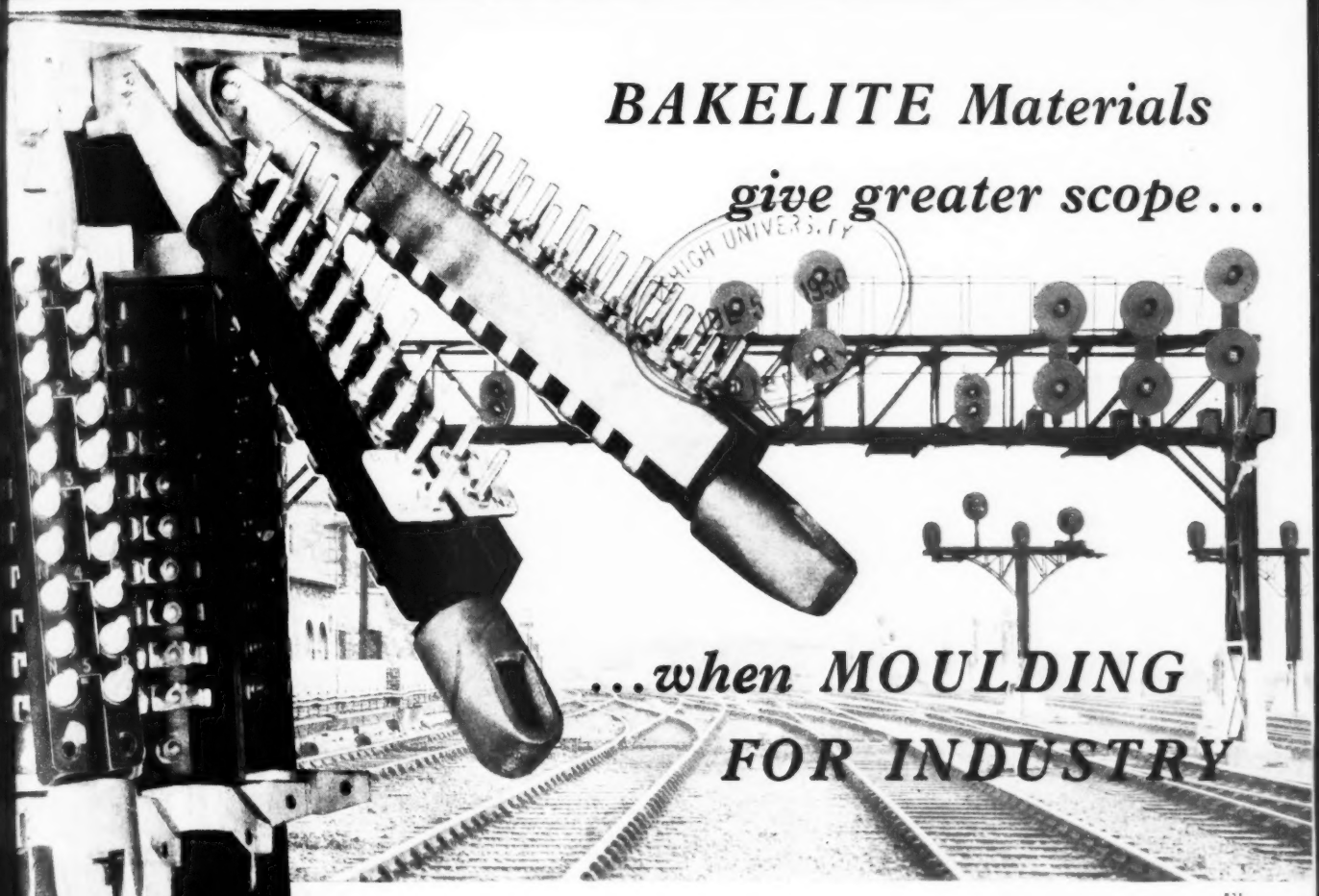

BAKELITE Materials give greater scope... ...when MOULDING FOR INDUSTRY

P21

The railways of the world rely on Westinghouse signalling—and Westinghouse rely on BAKELITE materials. A typical example is the hinged terminal rack of the solenoid-operated circuit controllers. These racks are moulded to withstand intensive use. Their design makes possible the rapid removal and release of the relay assembly without disturbing the external wiring to the controller. A BAKELITE material was selected because it provides the high strength and insulation properties essential to minimise the risk of even an isolated failure.

Hinged terminal racks moulded in BAKELITE Material by the Westinghouse B. & S. Co. for their railway signalling system.

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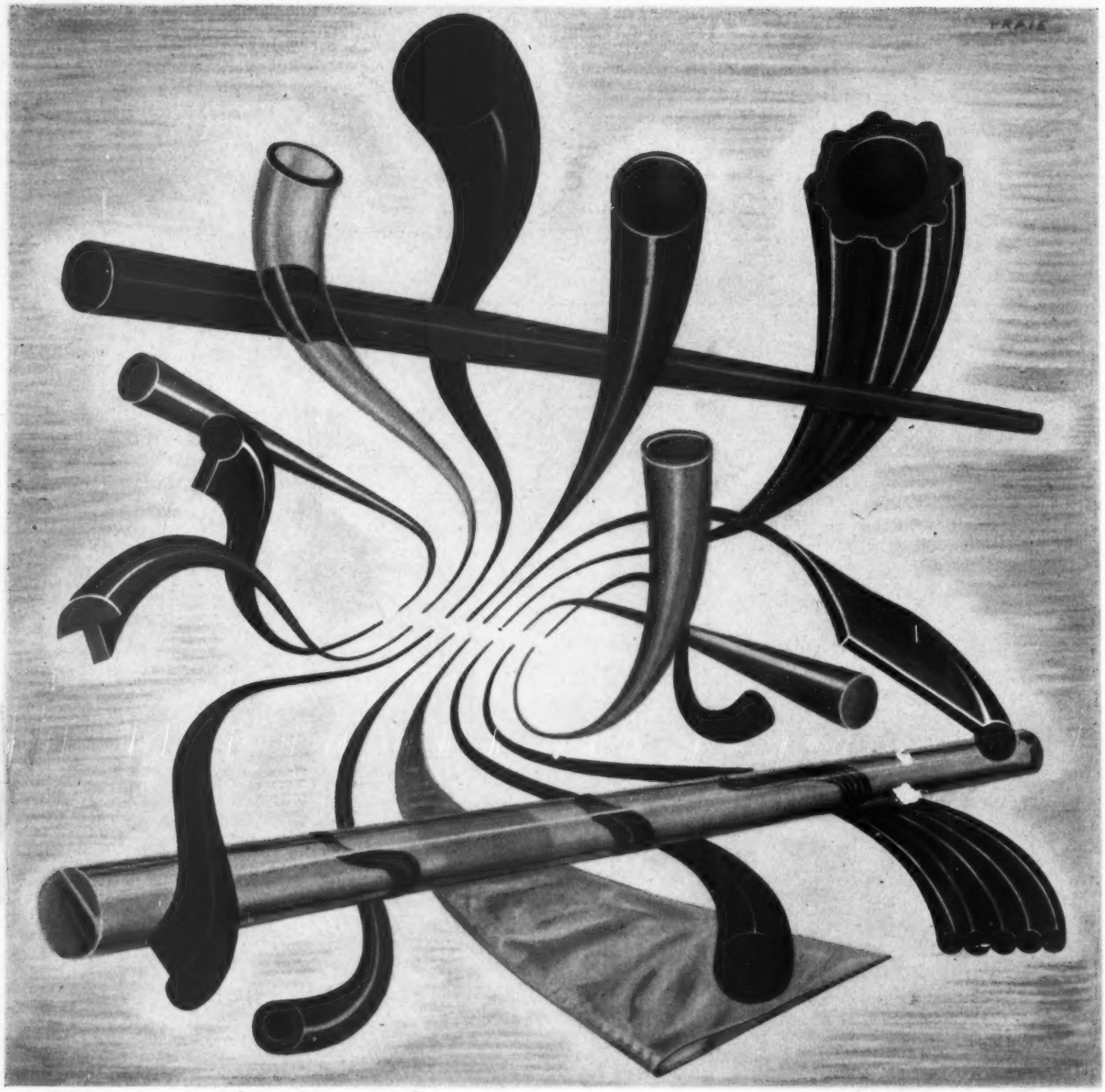

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Plastics

VOL. XV. No. 157. JUNE, 1950

"To my mind this story is one of the romances of our time. It has only dawned on us what it is all about, but in reality it is much older than mankind and stretches right back to the beginnings of life. We are rightly proud of what has been achieved in the textile industries by traditional craftsmanship, but now it turns out that Nature has been doing similar things with molecules for ages, and doing them infinitely better. Take for instance the skin of the common earth worm. There is a fabric if you like! Living nature is in fact one gigantic textile business, and now that we have discovered this and are taking the lessons to heart . . . a whole new world is opening up—a world in which medical men and wool sorters, plastics manufacturers and geneticists, cotton spinners, gardeners and tyre merchants, are all partners in a single great adventure."

Professor W. T. Astbury, "The Science of Fibres."
(From "Science Survey," published by Sampson Low, Marston and Co.)

EDITORIALS

Our Shop Window

ON other pages in this issue we publish a pictorial review of the chief plastics stands in the British Industries Fair, both at Earls Court, London, and at Castle Bromwich.

The captains and the kings of the industry have now departed from it and we await more definite reports than those general ones we have already gathered for a more accurate assessment of the business obtained. Certainly there was a record attendance of overseas visitors to both towns totalling 19,005 compared with 17,061 in 1949. On the other hand, the number of home trade visitors to the Fair numbered less than last year, 113,102 compared with 121,555. It is most interesting that this reversal of attendance is paralleled by the very general report received from stand holders that home orders were quiet but that foreign and commonwealth orders were satisfactory and, in some branches, excellent. On the whole it is far too early to make an assessment, and we must remain content with the increased presence of buyers from abroad. Certainly they were very evident on the plastics sections, a fact that corroborates the opinion that Great Britain, for the time being at least, stands supreme in Europe as plastics producers, moulders and fabricators.

Home trade has been far from lively during the past year in the industrial fields, and we are all waiting for a move on the part of the Government which will increase (however slightly) the spending power of the public. The freeing of steel may permit the production of more motorcars and more of those industrial productions which employ plastics. The freeing of petrol, quite apart from encouraging motoring, may prove such a source of increased revenue that the Chancellor's heart may be so softened as to remove certain purchase taxes. If the 1951 Festival of Britain is to be a success, Sir Stafford Cripps would do well to make it a festival for Britons as well as for foreign visitors by allowing them to lift up their own hearts first.

The Federation Stand

WE suppose that there was no more important discussion in the plastics section among the stand-holders themselves than the merits and demerits of the exhibits of the 18 companies that had taken the opportunity to band themselves together on one stand at Earls Court under the ægis of the British Plastics Federation with the view to cutting the expenses of large individual stands. The cost of this larger type can be anything between £3,000 and £5,000, which, admittedly, takes some earning, and prestige counts little if business does not accompany it.

On the other hand, propaganda is rarely a matter of quick returns, especially in our industry, which is so young and keeps young because of the rapid advances therein, and it would appear to us that the action of taking small stands as a collective unit has been too precipitate to say the least. If the individual concerns really cannot afford such expenditure, there is nothing to add. If they really can, then they have not possessed the patience and long-term wisdom which spending for propaganda entails. At a period when, as Mr. C. F. Merriam said so recently at the Federation lunch, production was increasing by leaps and bounds, we think the move not happily timed.

The change to the "small window" type of exhibit is so revolutionary that memory of the large stands of previous years cannot but regard the move as a backward one. This method of analysis—that is, the presumption that size is important—may be, and often obviously is, a completely fallacious one, but the normal human mind is not now attuned as it was, say, 50 years ago, to perceive quality, and more especially the possibilities of variety and quantity of production in the very small exhibit, behind tightly closed windows. In any event, quite apart from the smallness of each, the close proximity of them was as irksome to the persons in charge as it was to the visitor. The general effect to many "outside" friends was that the industry had lost in dignity (which may be) and in power (which is clearly nonsense).

More Propaganda Wanted

OUR own disappointment is caused rather by the obviously diminished propaganda that has resulted. We agree that visits to stands by existing customers is pleasant but rarely additionally remunerative, but we cannot agree that the non-technical visitor who may be an industrialist or a lady-visitor seeking amusement is completely useless as a prospective user of plastics. Have we forgotten the brave words that were spoken everywhere by our leaders and writers in the technical journals of 1947/1948 as a result of the bady made, badly designed articles foisted on an all-too unsuspecting public by the cohorts of spivs? Did we not urge the education of the public on matters plastic? And what is more important,

have not the 20,000,000 women and the 20,000,000 ordinary men the power to turn our industry into roaring prosperity? They already accept the telephone, the switch cover, the vacuum cleaner and the electric iron without knowing that an ounce of plastics goes to their make-up, because they have been made for the public by a highly organized, highly technical and highly propaganda-conscious electrical industry. We must do the same for the non-technical jobs. If each housewife in the country brought one high-quality plastic cup and saucer per annum, one set of plastic condiment nolders, one saucepan with a plastic handle, then the plastics industry would be the busiest in the country. But the housewife and her husband must be told why they should want these things. The Federation stand told them nothing. It was cold—as cold as charity.

Moulding Machines

WE cannot but help expressing our extreme pleasure at the magnificent shows devised by the several moulding machine manufacturers at Castle Bromwich, where they had all collected. This Birmingham Fair has always proved a greater attraction for large engineering products than have the sections in London.

Especially encouraging was the fact that so many machines have improved enormously in quality and more obviously noticeable in appearance, sensible stream-lining and quality of finish. This always must be a factor in business now, however technical the product.

Another excellent point was the fact that all machines were producing finished objects. The splendid automatically controlled down-stroke press with special tooling by B.I.P. Engineering worked throughout the period of the Fair turning out electric-iron handles, the new Bradley and Turton down-stroke press with its new automatic control unit produced electrical units, while on the Alfred Herbert stand the new Daniels' transfer press with its Timemaster control emitted technical mouldings, and the Edgwich injection machine produced nylon combs with pleasing regularity for the public. The Finney 200-ton hobbing press was always in action, while the beautifully streamlined Hupfield 2-oz. injection machine produced dishes, and the Projectile and Engineering Company's Peco HL2 2-oz. machine units in Tenite II (cellulose aceto-butyrate).

Perhaps the most spectacular stand was that of R. H. Windsor, Ltd. At last the two-screw action L.M.P. extrusion machine was on view and working continuously producing two-coloured strip. Examples of blown extruded p.v.c. for slitting into sheet and the plastic-reinforced plastic tube (hard on the outside on a softer inner tube) were shown. This company's 16/20 injection machine produced the Dallas saxophone to the huge enjoyment of music-lovers!

MOULDING POWDER AND SHOT

Charles II to George VI

If you had been about in the year 1680 (which is most unlikely, but at least you would now be getting your post-war credit) and had wandered outside the new London that Wren had put up after the Great Fire you might have seen, in the country village of St. Giles-in-the-Fields (now Old Compton Street, Soho), a little workshop, and a man making wicker-baskets. And if you didn't know this, Sam Pepys probably did. The basket maker was William Scott, who had been admitted a Freeman of the Worshipful Company of Basketmakers of London in

1661, but had not been allowed to return to the new town to pursue his work, since his trade, like those of soap-boiling and tallow-chandling, was considered dangerous. Let me jump a few hundred years to the 1950 British Industries Fair, for quite near the Plastics Section I saw, with my own eyes, a stand: G. W. Scott and Sons, Ltd., of Soho Wicker Works, Cambridge Circus, London, W.C.2. The ownership of the business has remained throughout in the family of the founder. although the last of the male Scotts was killed in 1942 flying his bomber. Happily two of the family are still associated with the company. Nearly three hundred years and wicker-baskets are still made here. But with a difference! I reproduce my photograph of the stand at the B.I.F.; almost every basket is a picnic basket, and so far as I could judge every cup, saucer, plate and vacuum flask was of urea plastics. Of course, we know that plastics are the only solution, but the whole industry can feel proud to serve such a remarkable family and such an ancient craft.

* * *

Out, Damned Tax

It is not often that we comment on the purely economic and selling side of the plastics industry, but we have heard so many bitter comments by distributors of goods, especially those in the fancy goods trades, that we must comment on one case which, while no worse than a hundred others, is enough to drive the average distributor into a lunatic asylum. Both objects in the picture are table-napkin rings. That on the left is subjected to 33⅓ per cent. purchase tax, that on the right to 100 per cent. The reason for the difference: That on the right is decorated by the addition of the rabbit! As a result the one on the right does not sell anywhere near so well as the other in the home market, although it is the more attractive to the child. This at a time when we should have a good home market to enable us to sell abroad with advantage.

DOGSBODDY.

Reflections on the 1950 Fair

THERE is no doubt in our minds, and in the opinion of many visitors, that the exhibits at most of the large stands in the plastics section at Earls Court had improved greatly. This refers not only to the layout of the stands but to the fact that there was also a marked improvement in the quality of the goods shown. This was apparent not only in the technical units, whose quality has always been high, but what is in a sense more important, in the non-technical productions, and among these especially in the toy sections. These are the other light sections of the industry to be congratulated on their workmanship, for the markets they can capture by high-class technique and bright ideas are indeed enormous.

Before we go on to detail the collections on individual stands, we crave the indulgence of our readers to make a few unorderly but consequential reports.

On the whole, as we have said before, it is the raw material section that can more readily approach the ideal in the matter of propaganda, and with a colourful or descriptive "flow-sheet" can show the uninitiated the process of production from raw material to plastic powder or sheet or other form on the finished moulded or fabricated shape. We like the large stand for the raw material manufacturers, and we hope that they will never revert to the small type; obviously it must be a spacious job, and is automatically colourful. This method was adopted at Earls Court by three concerns:—

British Celanese, Ltd. The product of this company is cellulose acetate in a variety of forms; in powder for moulding, in sheet and in extruded rods and tubes. On the stand were seen excellent examples of the clear, flexible, tough sheet in a number of lovely shapes used for packaging extruded rods and tubes for a variety of purposes, ranging from tool handles to hand-railing, from perambulators to omnibus rails, and moulding powder for the production of a multitude of toys, fancy and other goods. New specialities on show were spirally wound acetate film and foil, and a laminate for show cards and book jackets. A new "joint" system for "Celastoid" tubing was exhibited, made by Porter London, Ltd., and High Pressure Openings, Ltd. Here also was seen printed transparent sheet in book form for demonstrating engineering components and biological systems.

Courtaulds, Ltd. The stand of this concern, famous for its high-quality cellulose acetate in powder, in sheet and extruded form, was equally attractive for its beautiful and clear layout, and also displayed packaging material and objects manufactured by its customers. Of special attraction in the extruded field were the wicker-baskets of extruded acetate constructed in varying colours to give a beautiful and very tough structure capable of very hard wear. The capabilities of moulding with cellulose acetate were shown by the Bluemel motorcar steering wheels in which the acetate is moulded round the metal base and hub, and toys, such as the miniature "Rolls-Royce" manufactured by Mettoy Co., Ltd. Of special interest here was a new production by Fraser and Glass, Ltd., in Courtauld's specially hard cellulose acetate of a new type of welder's protective goggles which has passed B.S. specifications.

I.C.I. Plastics Division. This was the largest stand in the plastics section and was beautifully designed and laid out to show the flow from raw materials to finished products. The whole was, in fact, sectioned to show end products of each of the company's plastics materials: polyvinyl chloride, nylon, polythene, etc. Among new applications are a miner's lamp in alkathene of special importance because of its truly unbreakable character and a fish-box coated in urea-formaldehyde resin. A new range of "Diakon" methyl methacrylate injection moulding material was on show and is claimed to be easier to mould than older types. "Fluon" (polytetrafluorethylene) the new high-temperature and highly chemical resistant product was also on view. Its use is at present restricted to special electrical and chemical applications. Here also an Edgwick (Type HY) injection machine was working, turning out "Alkathene" eye baths which were eagerly snatched up by the waiting queue.

Before we go on to discuss the moulders' collections in alphabetical order, may we make a specific report on one of them? It was that of **Rosnoid, Ltd.**, a newcomer to the Fair, a company

A group of productions from the British plastics industry as exhibited on the "Plastics" stand at the 1950 B.I.F.

which is famous among the knowledgeable in one special sphere of plastic moulding, but which, for reasons of its own, has hitherto hidden its light. Without any doubt whatsoever this was the finest moulders' stand we have yet seen in any plastics show at any time and place in the world, and we have seen a great many. This may seem somewhat extravagant language, but we hope that many in the plastics industry saw it, in spite of it having been in the backwater of the plastics section. Our opinion may have been biased because of the superb workmanship of the mouldings and because one complete wall was filled with cream-coloured mouldings, so giving a unique effect. The fact of the matter is that this company specializes in ship's interior fittings, by which we mean those cabin fixtures and additions, such as lamp-shades and holders, soap-dishes, vacuum flasks, door handles, rails, etc., that are generally cream-coloured. Moreover, each object was segregated in box-like shelves and each was mounted and removable for examination. Thus a very large number of mouldings were seen and yet there was no appearance of crowding. We specially welcome this company's advent to the Exhibition for the lesson it taught us. We noted also that the company has now widened its market into the general industrial field. As to the mouldings themselves, all were of outstanding quality, especially those for use on ships. Beautifully designed, specially strong types are made, handles and rails being mounted on metal inserts, while lamp-shades are of the special urea moulding powder to give exceptional resistance to high temperatures. Especially noteworthy were the excellent shapes of the vacuum flasks, one range, made for a big Dutch Line, being outstanding for its beauty.

Dealing first with the collective British Plastics Federation stand of some five raw material manufacturers and 13 moulding and extruding factories, it was impossible for the knowledgeable not to express a feeling of pleasure and pride at the technical quality of the exhibits. To us, this has been enhanced by a visit at the end of May to the Paris Fair, few exhibits there being at all comparable with the British manufactures.

BX Plastics, Ltd. This stand was confined to showing "Bexoid" cellulose acetate, "Bexene" p.v.c. thin sheet and "Lactoid" casein, all raw materials made by this concern and employed for a wide range of both technical and fancy goods.

Bakelite, Ltd. Finished goods from the ranges of phenolic and urea moulding powders, laminations for the electric industry, "Warerite" for decorative wall panellings, bar-tops and tables and the "Vybak" polyvinyl compounds made by this company were on view.

British Geon, Ltd. This concern with its great new factory at Barry, where polymers and co-polymers of the vinyl groups are

made as latexes, moulding, extrusion and sheet, and compounds and pastes for "slush" moulding, used the essence of simplicity in the design of its stand.

British Moulded Plastics, Ltd. The great moulding firm confined itself to a few specific and outstanding examples of its excellent work, which included a Bush 9-in. television cabinet, the "Excelvac" vacuum jug, and the remarkable injection moulded "Dallas" saxophone.

British Resin Products, Ltd. This concern is one of the earliest producers of cellulose acetate and "Rockite" phenolic moulding powders. It is the only company in the country that manufactures the specialized cashew nut resins for laminating.

E. K. Cole, Ltd. (Plastics Division). Radio cabinet design in plastics may be said to have begun with Ekco's, who manufactured splendidly starting forms as long ago as 1932. Their stand included two excellent jobs, one a microphone and case in cellulose acetate and the second a cream-coloured case for an edition of the Philco radio, which has not yet been released.

De La Rue Extrusions, Ltd., have specialized in a sphere of plastics that has carved a market of its own. Extrusions in strip and tube for applications as wide as table edging, panel strips and fountain-pen ink tubings, employ cellulose aceto-butyrate, cellulose acetate, hard and soft p.v.c., and polythene. The latter is especially useful with petrol and other hydrocarbon oils.

Thomas De La Rue and Co., Ltd. The use of laminates of the decorative type was excellently portrayed in the model of an hotel wherein "Formica" sheet was employed for wall panelling, bar tops, bathrooms and bedrooms. We commented on this, that the exhibit was one of the very few that at all lent itself to reproduction on a miniature scale. But how much more pleased would we have been to see it on a larger one, in fact on the scale seen at last year's B.I.F., which was superb.

Ebonestos Industries, Ltd. This concern, one of the stalwarts of the industry and of high-precision, high-quality mouldings, confines its production almost entirely to highly technical productions in the electrical, engineering, automobile industries and the production of scientific instrument and meter cases.

Erinoid, Ltd. One of the pioneers in the casein industry, this company has steadily developed in the manufacture of high-quality cellulose acetate moulding powders and polyvinyl compounds in sheet and other forms. More latterly and in pace with production from petroleum, polystyrene is manufactured as moulding powder.

Halex, Ltd. Of special interest on this stand were the products produced on this company's 40-oz. H.P.M. injection machine. We have already mentioned in these pages their 2-lb. washing bowl of polythene which has achieved wide and deserved popularity among housewives. This has been improved by making it translucent instead of opaque, thus rendering it much more attractive in appearance. An example of a second moulding was also on view in the form of a large radio cabinet in cellulose aceto-butyrate. The whole plastics industry is watching the progress of the injection moulding of large objects on this and the other big machines in the country from an economic point of view.

Insulators, Ltd. Here again we have a very old-established concern mainly married to technical industrial applications with stress on the electrical (including radio), automotive and generally engineering side. Examples of these were on view, but so flexible are such concerns and indeed so technical are apparently non-technical jobs, that we see the emergence of productions like the "Doidy" melamine cup for infants and invalids and the "Teledex" telephone index. The former, if we may be Euclidean for a moment, is a cup of rhomboidal cylindrical shape or, to be non-Euclidean—askew, so that it may be used by reclining patients with comfort; we shall be publishing a photograph of this in our next issue to explain the curious shape. The "Teledex" index made for Paragon, Ltd., we describe with photographs on page 171.

Kent Mouldings. Among many different industrial units produced by this concern plastic bobbins for the textile industry takes pride of place and excellent examples, among others shown here, were the large knitting bobbins made for I. L. Berridge and Co. We ourselves had the privilege of showing this magnificent phenolic moulding on "Plastics" stand.

Melwood Thermoplastics, Ltd. First-class extruders specializing in soft and rigid p.v.c. Well known for a wide variety of belting and "panel-strip." New applications were seen here in the Gloria liquid shampoo packs heat-sealed in p.v.c. thin wall tubing. There was also rigid p.v.c. extrusions for slide rules and a novel and useful gauge machined from hard p.v.c. for measuring tubes. This is the first machining of p.v.c. we have encountered.

Punfield and Barstow (Mouldings), Ltd. Specialists in high-quality, high-precision injection moulders, this company has in general confined itself to the smaller type of production units which have to pass the stringent tests of the electrical field, including radar, radio and television components. Hence we noted the beautiful specimens in the complete range of thermoplastics, cellulose acetate, polystyrene, polythene, p.v.c. and the newer nylon.

Scott, Bader and Co., Ltd. We welcome this newcomer to the Plastics Section, although they are sufficiently well known in the chemical and paint industries. Manufacturers of Marco Resins, the polyester contact types which are finding increasing uses as bonding and impregnating agents in the electrical and aeronautical fields. Most interesting were the examples of their use as casting resins, one of a lung-structure being especially noteworthy.

Armoride, Ltd., Commercial Plastics, Ltd., Dacrematt, Ltd., Dunlop Special Products, Ltd., Duraplex (Plastics), Ltd., Kenverne, Ltd., Stanley Smith and Co., Vinatex, Ltd., Wallington, Weston and Co., Ltd. The improvements shown in p.v.c. sheet, backed and unbacked, in the new designs and in the ingenious and delicate use of colour, was impressive and most encouraging for future trade. Embossings to simulate leathers have now reached a high state of perfection, but we also note that some manufacturers are excelling themselves in introducing new designs completely divorced from leather. One type is termed "satin," the effect being produced by the embossing of extremely fine lines resulting in light refraction. This deserves to be a money-maker.

Commercial Plastics, Ltd. In addition to the excellent thin and thick sheet produced by this concern, we note that "Fablon" is also being sold for packaging purposes.

Dunlop Special Products, Ltd. As is indicated above, this new subsidiary of Dunlops has entered the p.v.c. sheeting industry. In addition, hard p.v.c. is made and an interesting development in this field was seen in cutting pads used to protect cutting tools.

P. B. Cow and Co., Ltd. Last year we noted the large range of p.v.c. sheeting and p.v.c. toys made by this company, as well as a wide range of moulded goods. This year table and picnic ware, toys and fancy goods were prominent. New lines included unbreakable beakers, butter dishes and a jam-jar holder and lid.

Hornflowa, Ltd. One might have imagined that this concern, which has its factory in Cumberland and manufactures buttons only, would have had some difficulty in designing its stand. However this may have been, it was one of the brightest and most attractive, for the designer had used the colourful buttons to form huge sunflowers which attracted the eye immediately. The buttons themselves, made from keratin-urea moulding powders, possess a natural beauty and technically are precision moulded with countersunk holes to avoid wear of thread.

Injection Moulders, Ltd. Specialists in injection mouldings, this company has long been responsible for some of the finest technical and fancy goods products that have appeared. Building bricks, a hat with a rabbit within that jumps out on the magic touch, a tumbling clown, performing monkey and a set of trinkets for Christmas decorations were some of the novelties on show.

C. and C. Marshall, Ltd. Manufacturers of extrusions specializing for the motor trade for wing-piping and draught extruders. A new endeavour is a p.v.c. lightning fastener which does not employ metal locking. The fastening is obtained by interlocking channels in the p.v.c. strips.

Moulded Components (Jablo), Ltd. This concern, best known for its laminated improved wood structures, has entered the expanded plastics field. On view was "Aero-Jablex," a sponge form for use in upholstery, etc. Weight varies between 2½ lb. to 3½ lb. per cubic ft. and it conforms to British Standard 476 for fire tests on non-inflammable materials.

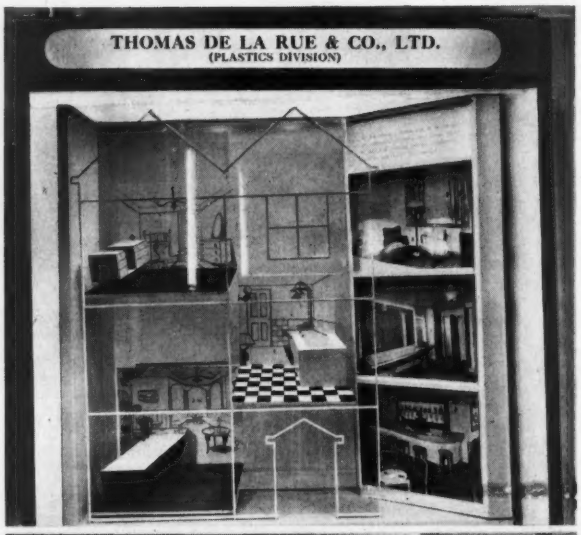
Optoplast Manufacturing Co., Ltd. This was the sole exhibitor of any sort of plant at Earls Court. This was the "Pimo" machine for inserting metal reinforcements into acetate spectacle sides, with absolute precision. The acetate part is first placed in a hot oil bath and when soft is transferred to a steel jig. In this position a plunger forces the metal wire into the plastic. Temperature control is very close and precision jigs and plungers ensure perfect placing.

P.A. Permuta (Plastics), Ltd. This was one of the largest stands in the section with an amazing selection of domestic ware and toys, the bright and pleasing colours of which certainly attracted, first, Queen Mary, and then the other members of the Royal Family, all of whom bought toys. One of the most attractive sections to us was the display of excellently designed and moulded melamine cups, saucers and plates. Melamine is certainly increasing the buying of domestic ware.

(*Continued on page* 169.)

This year, for the first time in the history of the B.I.F., eighteen member-firms of the British Plastics Federation exhibited on a combined stand in the Plastics Section at Earl's Court, London. Their 16 individual showcases are reproduced on this and the two following pages. Exhibits by Ebonestos Industries Ltd. and Mica Products Ltd. were included with those of Crystalate Ltd.

BRITISH RESIN PRODUCTS LTD.
BRP


THOMAS DE LA RUE & CO., LTD.
(PLASTICS DIVISION)

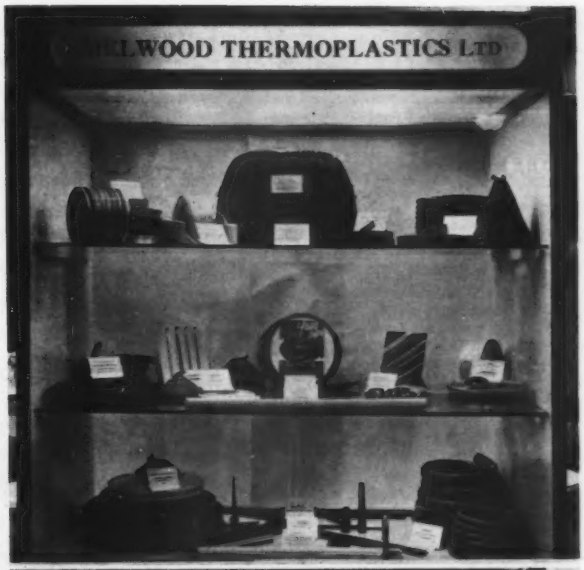
EKCO PLASTICS (E. K. COLE LTD.)

ERINOID LTD.

CRYSTALATE LTD.

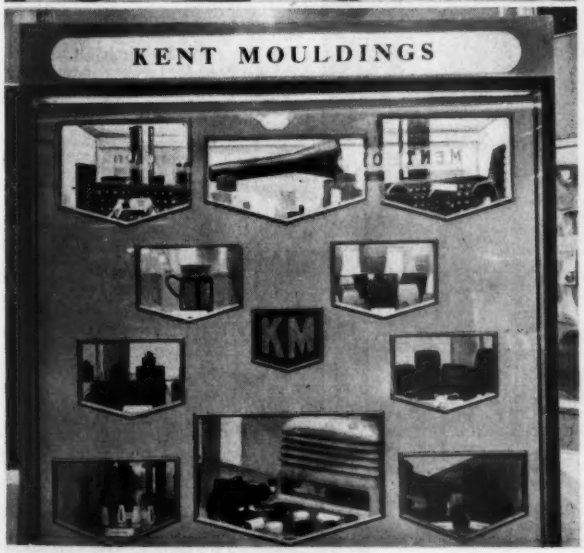
DE LA RUE EXTRUSIONS LTD.

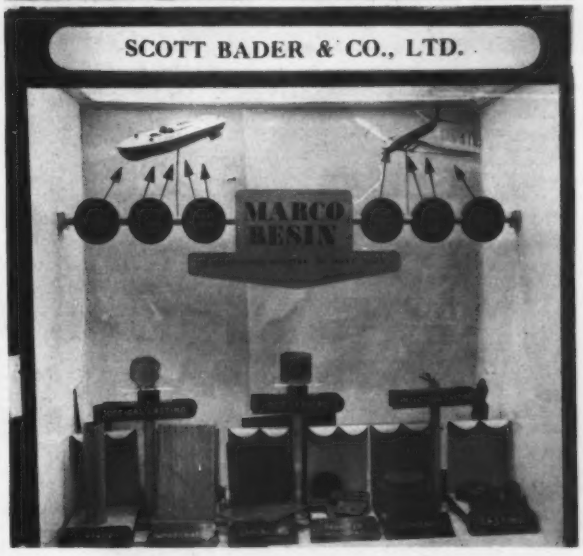
INSULATORS LTD.


WOOD THERMOPLASTICS LTD

HALEX LTD.

PUNFIELD & BARSTOW
(MOULDINGS) LTD.

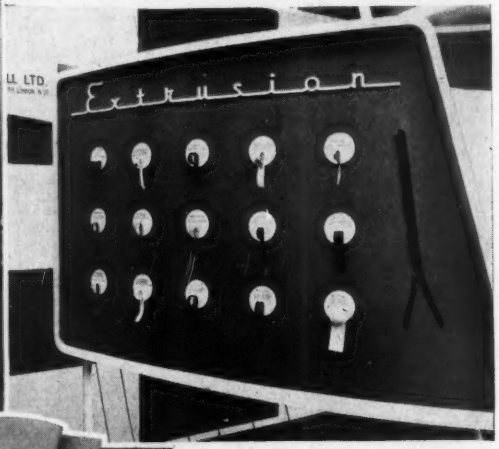

KENT MOULDINGS
KM


SCOTT BADER & CO., LTD.
MARCO
RESIN

On this page and the four pages following we give illustrations of other stands in the Plastics Section of the 1950 B.I.F., at Earls Court, together with a few stands of plastics interest from the Olympia Section of the Fair.

(Above) Hornflowa, Ltd.: A display of buttons, for which this concern is so well known, including a new range mottled throughout.

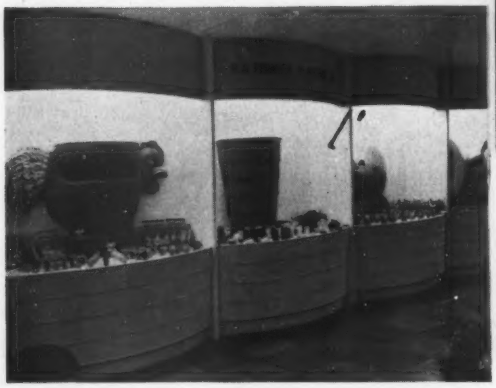
(Above and right) Vinatex, Ltd., subsidiary of Vinyl Products Ltd.: Applications of p.v.c. compounds and pastes, and flexible moulds made with "Vinamold" hot melt compound.



(Above) Optoplast Manufacturing Co., Ltd.: Demonstration of "Pimo" equipment for making reinforced sides for spectacles frames.

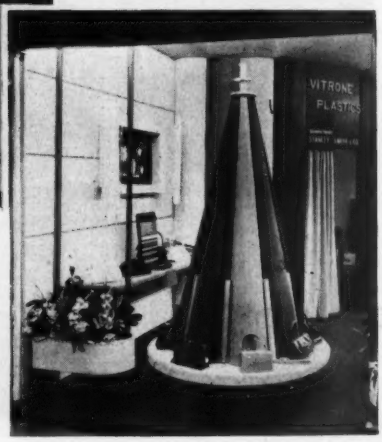
(Above) C. and C. Marshall, Ltd.: P.V.C. extrusions for motor cars, fancy goods, and other uses. An interlocking "Phlipgrip" fastener made in extruded p.v.c. is seen on the right.

(Below) Stanley Smith and Co.: P.V.C. sheet for ladies' handbags and similar uses, and in highly polished grades for display purposes.



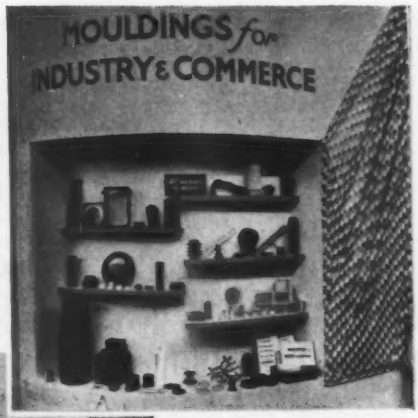
(Above) Jekmoth Home Store, Ltd.: Folding receptacles in plain and quilted vinyl sheeting for storage of clothes.

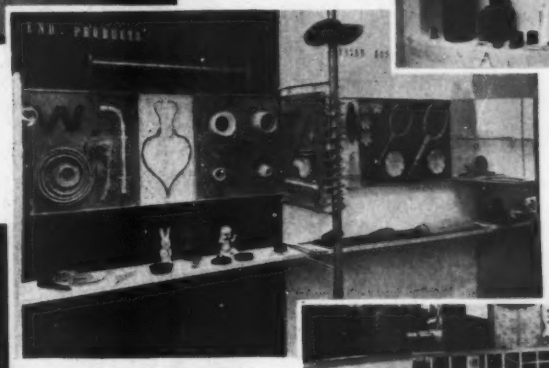
(Left) P. A. Permuta, Ltd.: Household goods and novelties in great variety of design and colour.



(Above) Plasticraft Ltd.: Injection moulded toys, including many novelties. Shots from the injection moulding machines are seen on the walls above the display.

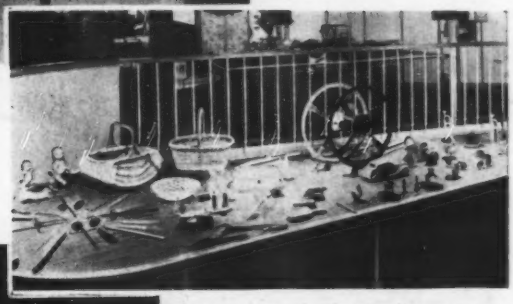
(Below) Imperial Chemical Industries Ltd., Plastics Division: End products of "Welvic" p.v.c. and of nylon, provided two of the many features at this stand, where injection moulding was also demonstrated on an "Edgwick" type machine.



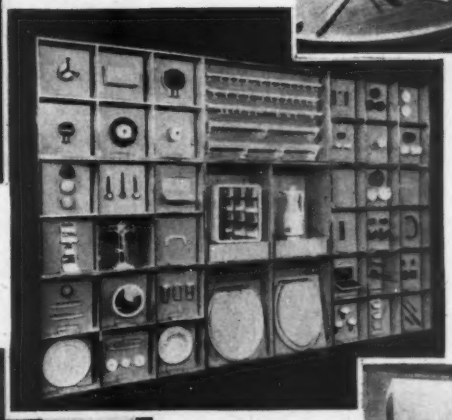


(Above) P. B. Cow and Co., Ltd.: Trade mouldings for industry, by the London Moulders Department of this company. Playballs in p.v.c. and domestic goods were also shown at this stand.

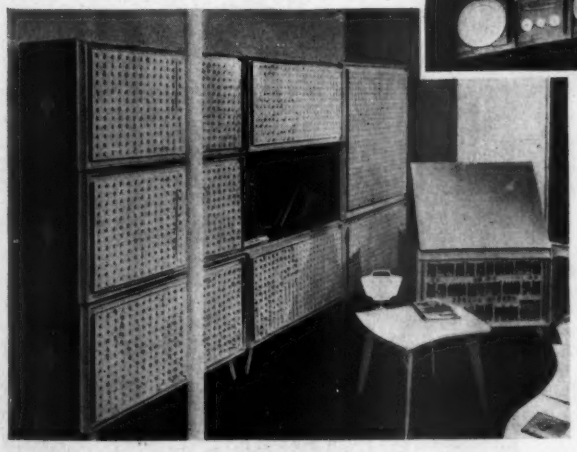
(Above and right) Roanoid Ltd.: High-class mouldings in great variety for ship fitting and other uses, assembled in a display which merits special commendation. Included is a bathroom cabinet moulded in one piece in urea.



(Above) Courtaulds Ltd.: Mouldings made from cellulose acetate powders in a wide range of colours. Cellulose acetate extrusions applied to the craft of basketmaking provided another feature at this stand.



(Below) Dunlop Special Products Ltd.: P.V.C. in the form of thin sheet, protective clothing and chemical tank linings.



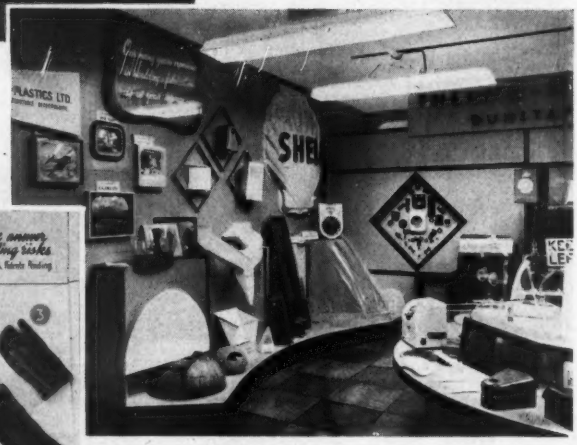
(Left) Scottish Furniture Manufacturers Ltd.: Interlaminate printed "Formica" is used for this nursery suite designed by Neville Ward and Frank Austin, for H. and A. G. Alexander and Co., Ltd.

(Above) Duraplex (Plastics) Ltd.: New designs, grains and finishes in p.v.c. sheet for the ladies' handbag trade exemplified by the actual made-up goods.

(Right) Injection Moulders Ltd.: Novelties for the toy trade include many which are particularly ingenious in design and have mechanical movement. A rabbit concealed in a tall "silk" hat pops out on pressing the sides of the hat.

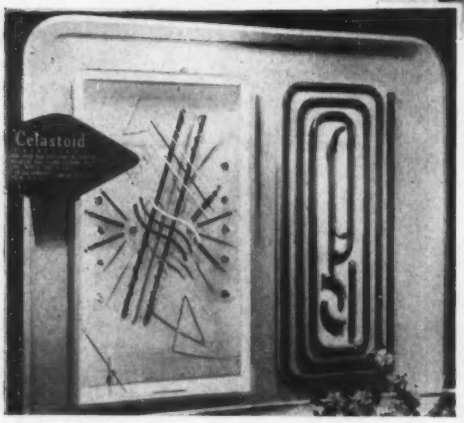
(Left and below) Thermo-Plastics Ltd.: Fabricated "Perspex," including domestic ware, a new sandwich container for railway refreshment rooms, and a dispenser for ice-cream wafers; lavatory seats, advertising signs, television implosion guards and aircraft components.

(Above) Moulded Components (Jablo) Ltd.: "Jabroc" densified wood laminate for jigs and textile machinery components. Also the new "Aero-Jablex" expanded plastic for cushioning.

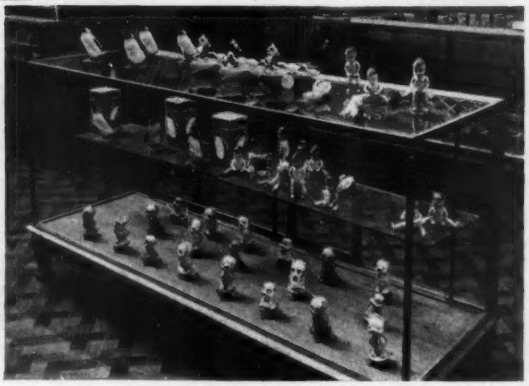


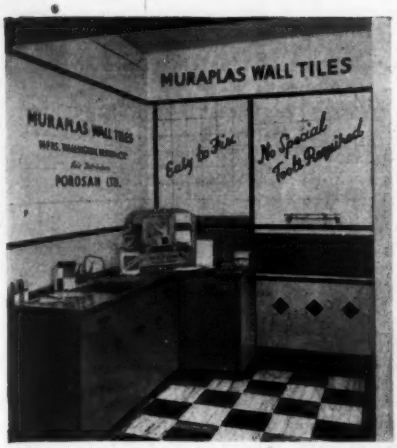
(Right) James North & Sons Ltd.: A complete range of p.v.c. gloves for the safe handling of chemicals.

(Below) Rosedale Associated Manufacturers Ltd.: Many new injection-moulded plastic toys and novelties were displayed at Olympia.

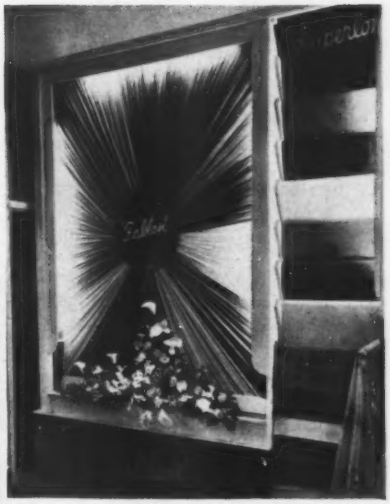


(Left) British Celanese Ltd.: "Celastoid" extruded cellulose acetate tubing used unsupported and as a covering for metal tube.





(Left and below) Wallington, Weston and Co., Ltd.: "Muraplas" wall tiles in the form of a thin laminate with a high-gloss vinyl surface are a new product of this company, who also exhibited vinyl sheeting for rainwear and curtains.



(Above) Commercial Plastics Ltd.: "Fablon," thin p.v.c. sheeting for curtains and for packaging, and "Superlon" leathercloth, supported and unsupported.

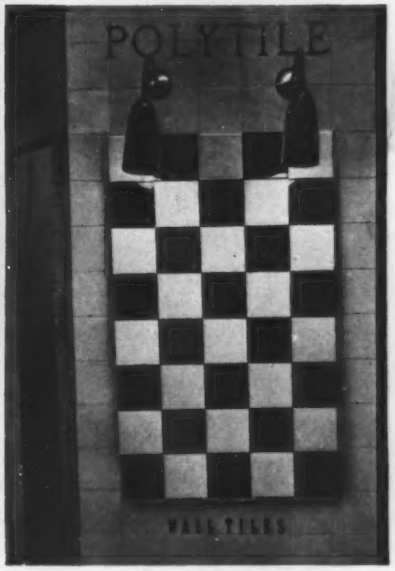
(Below) Mentmore Manufacturing Co., Ltd., Plastics Division: Cosmetic containers, toothbrush racks, and injection mouldings for the toy trade.

(Right) Armoride Ltd.: An attractive display of p.v.c. sheet and leathercloth for upholstery, travel goods, ladies' handbags, etc., including new grains and finishes and examples of use.

(Below) Darematt Ltd.: Examples of silk-screen printing for p.v.c. sheeting.

(Above) Triplex Safety Glass Co., Ltd.: Fabrications in "Perspex," comprise lighting features (including street lighting) and wash basins for caravans.

(Right) Stone and Simmons: "Polytile" wall tiles are made of polystyrene.



Further Notes on New Plastics Machinery

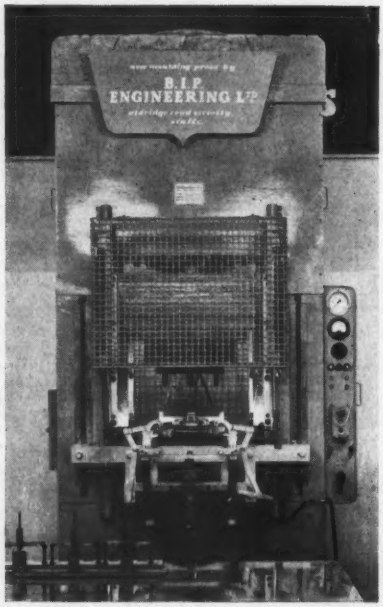
NEW and notably improved designs in machinery for the plastics industry, as exhibited at the Birmingham section of the B.I.F. this year, were far more numerous than on any former occasion of the Fair, a fact which points markedly to the growing importance of the plastics industry in this country and to our engineering achievements. Illustrations and details of most of these exhibits have already been published in our May issue. In a few instances, however, the actual machines were completed only just in time for inclusion at this year's Fair.

The compression and transfer moulding presses, shown for the first time by B.I.P. Engineering, Ltd., were designed for the re-equipment and general benefit of the thermosetting moulding industry, and in prototype form have been thoroughly tested under conditions of a 24-hour day production of commercial mouldings.

The basic models in downstroking oil-hydraulic presses for compression and transfer moulding (Types 100, 200) together cover a pressure range of 50 to 300 tons; the transfer-moulding rams are an optional feature. Operation is by single-lever manual valve or push-button actuated automatic cycle-controller.

The system of auto-control employed can be pre-set to reproduce with precision any moulding cycle capable of being performed manually, including "dwelling," breathing and successive application of low and high pressure. The speed of final closure is adjustable within wide limits. The length of cure is under the control of a separate time clock.

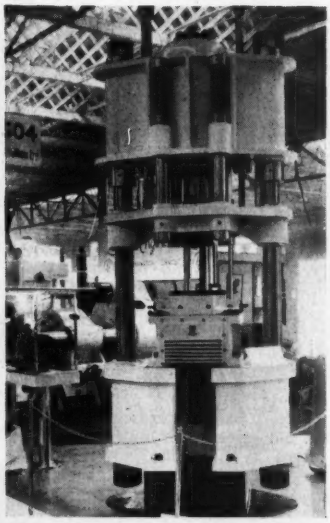
The new 150-ton downstroking press exhibited by Bradley and Turton, Ltd., follows the general lines of their standard presses (No. 336), but is fitted with self-contained pump unit and has a single-lever valve control. The pressure exerted is quickly adjustable between 150 and 25 tons and a special control device is fitted to slow down the speed of the main ram as the tools close.



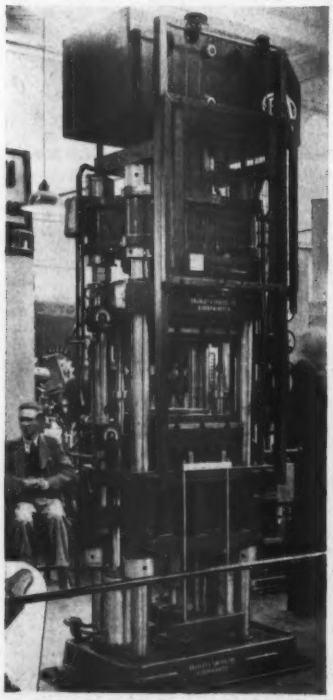
B.I.P. Engineering Ltd.: 50/300-ton downstroke press.

Among new machinery by Foster, Yates and Thom, Ltd., was a special 200-ton vertical two-column type downstroke extrusion press, which although specially designed with new features for research and experimental runs to control a production line of bar extrusion in non-ferrous alloys is equally of interest to the plastics industry. The valves to this press are arranged so that the extrusion ram moves at a constant speed for any particular given valve setting.

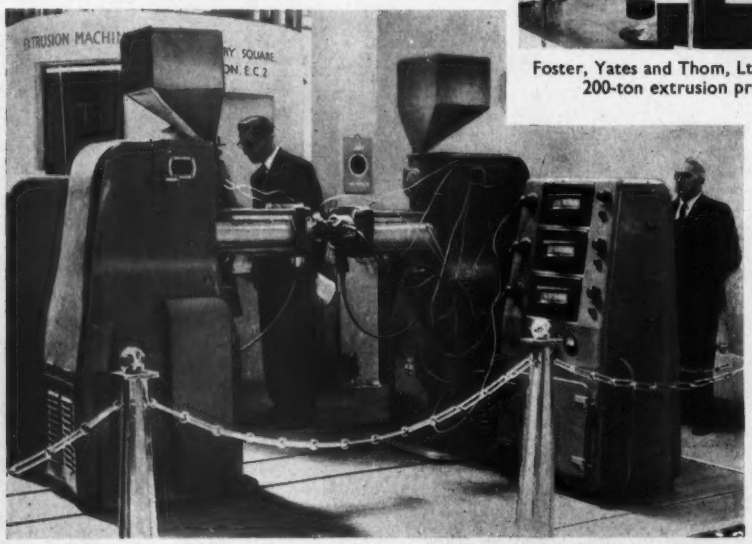
By far the most interesting of the new plastics machinery, however, is the new twin-screw L.M.P. extrusion machine by R. H. Windsor, Ltd., who have now secured the sole manufacturing rights for the multi-screw extrusional compounding machines covered by the L.M.P. patents. Details of this machinery have already been published in "Plastics" (1949/Nov./106).



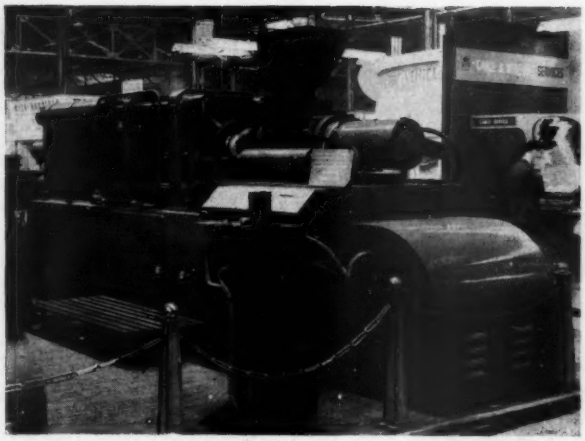
Foster, Yates and Thom, Ltd.: Special 200-ton extrusion press.



Bradley and Turton Ltd.: 25/150-ton downstroke press.



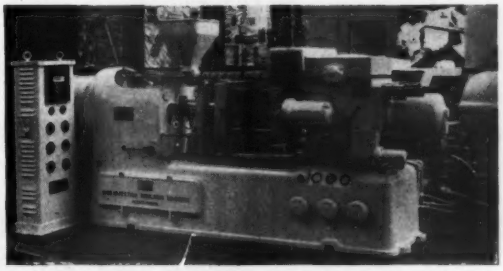
R. H. Windsor Ltd.: Two twin-screw L.M.P. extrusion machines operating through a single crosshead.



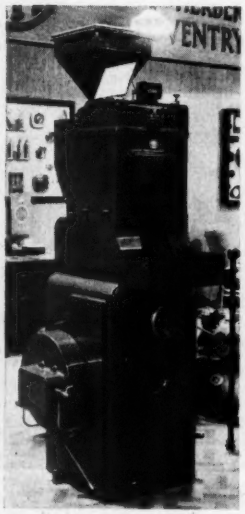
R. H. Windsor Ltd.: 16/20 oz. injection machine, here engaged in moulding the Dallas saxophone, exhibited at Earls Court by British Moulded Plastics Ltd. At this stand was shown the new twin-screw L.M.P. extrusion machine which is referred to on page 162.

(Above) Alfred Herbert Ltd.: New 75 ton Daniels transfer press, on left; 2/4 oz. Edgwick injection machine, on right.

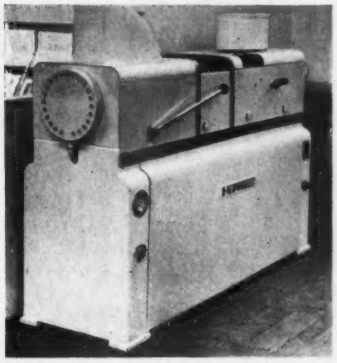
(Above) Funditor Ltd.: Machines for sawing plastics, and for marking plastics by sand jet.



(Above) E.M.B. Co., Ltd.: 9B injection machine, with temperature control pillar.



(Above) Daniels 2B tablet preforming machine (Alfred Herbert Ltd.)

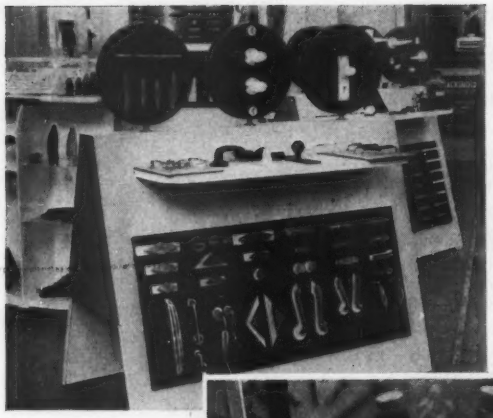


(Left) Hupfield Bros., Ltd.: 2 oz. injection machine incorporating new features.

(Right) Finney Presses Ltd.: 200 ton hobbing press; the Finney 50 ton transfer-stroke moulding press (dual unit) was also exhibited.

(Left) Precision casting, by B.I.P. Tools Ltd., and the new press for compression and transfer moulding by B.I.P Engineering Ltd.

(Right) Projectile and Engineering Co. Ltd.: 2 oz. injection machine, a new addition to the range made by this company.



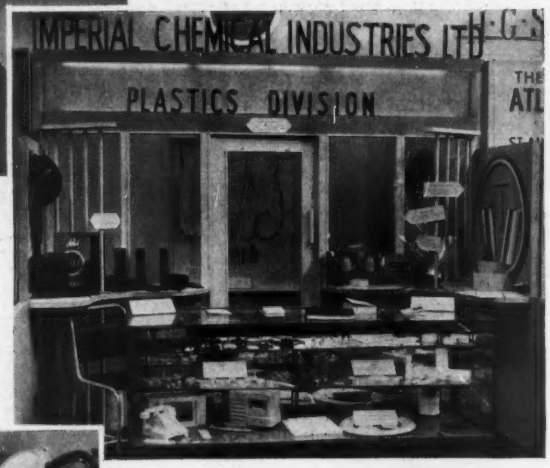
(Above) Lacrinoid Products Ltd.: Moulded door handles and cast motifs for decorative treatment of furniture.

(Above) Bakelite Ltd.: Part of a general display showing applications of "Bakelite" synthetic resins, moulding materials (phenolic and urea), and laminated sheet, rod and tube.

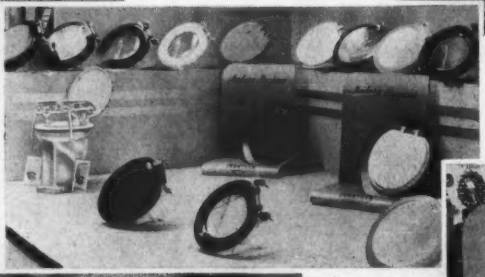
(Above) Thor Hammer Co.: Hammers with renewable polythene heads.

(Below) Imperial Chemical Industries Ltd., Plastics Division.

(Above) Moulded Products Ltd.: Moulded telephones and the new helmet for firemen.

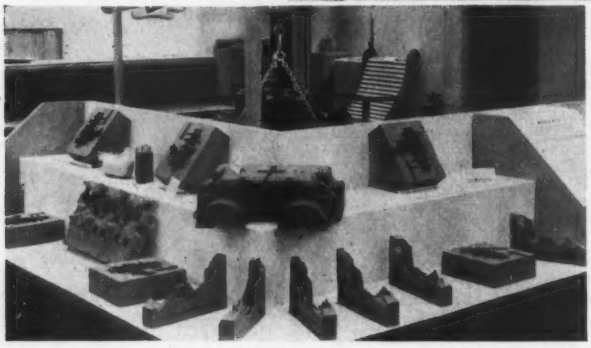


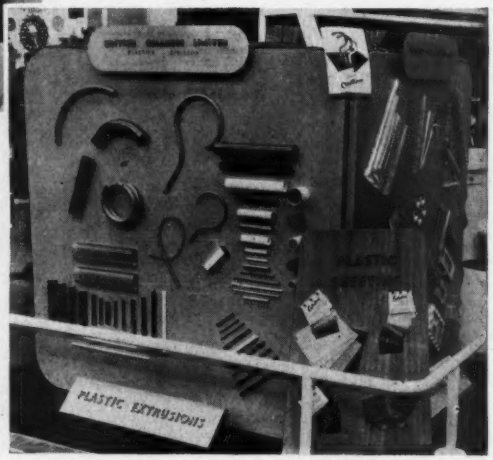
(Below) Robert McArd and Co., Ltd.: Plastic lavatory seats in all colours.



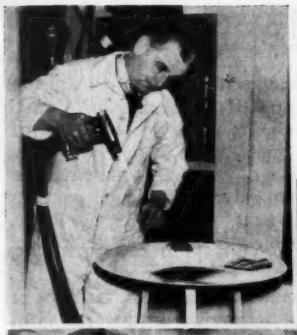
(Below) British Celanese Ltd.: "Celastoid" extrusions covering metal tubes, wood rods, etc., used constructionally and in making furniture.

(Below) Beetle Bond Ltd.: "Beetle" resins for bonding foundry sand cores.



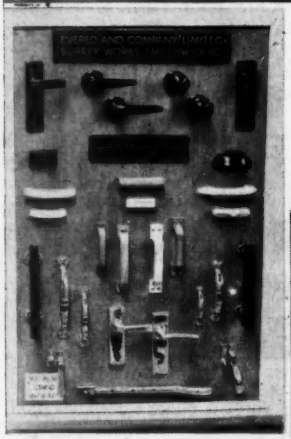


Plastic products exhibited at the Birmingham Section of the Fair.



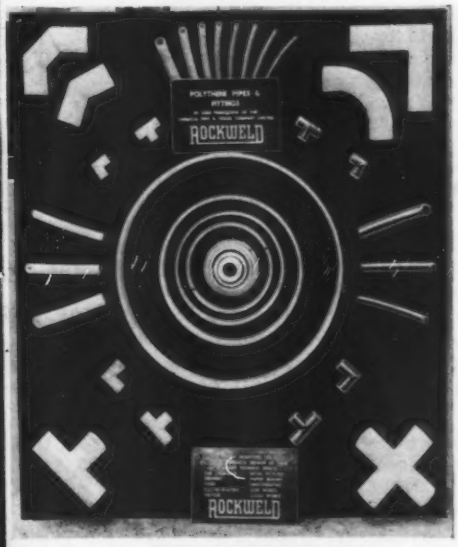
(Left and below) Schori Metallising Process Ltd.: Demonstration of flame-sprayed polythene.

(Above) Ioco Ltd.: Multi-colour patterns in "Zapide" vinyl-coated fabrics.

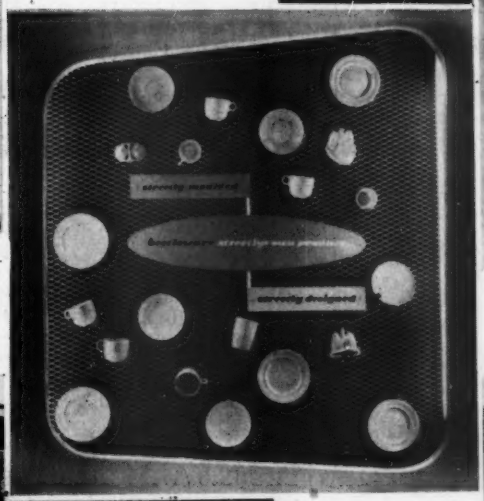


(Left) Evered and Co., Ltd.: Plastic hardware for builders.

(Right) Shires and Co. (London), Ltd.: Plastic cisterns and moulded lavatory seats.



(Above) Rockweld Ltd.: Polythene pipes and fittings for industrial plant.



(Right) Streetly Manufacturing Co. Ltd.: Part of the case history for a "Beetleware" product.

(Left) Thomas De La Rue and Co. Ltd., Plastics Division: "Delaron" gears and "Traffolyte" signs.

(Right) Holoplast Ltd.: Structural laminated plastics, including the new "Corroplast."

World's Industry Employs Plastics

GENERAL ENGINEERING

Plastic Impeller for Waterpump is introduced in the 1950 Cadillac engines. An accurate moulding eliminates machining and balancing problems. The plastic part, replacing a malleable iron impeller, is said to give satisfactory service at high temperatures with approved anti-freeze mixtures. About 81 per cent. weight is saved. ("Automotive Industries," 1950/Mar. 15/214.)

New replica methods.—A three-component material: polyester resin, filler, catalyst is prepared and a negative replica is prepared. Experience has shown that the material is very satisfactory for indicating general wear patterns and recording with extreme accuracy surface finishes. The Bureau of Ships, Department of the Navy, has used the method for recording surface condition of reduction gear teeth during test and normal operation. ("Mechanical Engineering," 1950/Feb./152.)

Polythene-coating plating jigs are made by soldering to each end of the jig a reasonably thick wire and heating it in an oven up to 165 degrees C. The jig is quickly removed and plunged in a box containing powdered "Telcothene" (polythene). ("Metal Industry" 1950/Feb. 24/152.)

Hard rubber as an engineering material.—In a well illustrated article J. R. Mackay shows that the combination of chemical, physical and electrical properties of hard rubbers make them useful materials for various purposes. Two types are described: (a) with about 25 to 35 per cent. sulphur content, giving a flexible product; (a) with about 35 to 50 per cent. (42 per cent. theoretical maximum) giving a rigid type. ("Materials and Methods," 1950/Feb./54.)

No-pressure moulding.—L. N. Phillips gives a review of experimental work at the Royal Aircraft Establishment with Durestos, a felt from asbestos fibres impregnated with water-soluble phenol-formaldehyde. Good physical properties are recorded. ("Aircraft Production," 1949/Nov./370.)

Alloy steels for moulds and hobs.—L. Sanderson surveys the various steels suitable for forming plastic shapes under pressure. These must possess high surface hardness while retaining a tough core. ("Metallurgia," 1950/Mar./248.)

Structural foils for greater strength.—R. E. Higgins and G. G. Havens investigated a number of modern sandwich materials for their ultimate strength with skins made of thin plywood, shell, aluminium, magnesium or impregnated fibreglass laminates and cores of cellulose foam, end grain balsa wood, foamed rubber, etc. ("Automotive Industries," 1950/Mar. 15/24.)

Measuring thickness of continuous strips of materials such as Cellophane, vinyl plastic, thin papers, etc., the Micrograph records the thickness of the material on a chart. ("Automotive Industries," 1950/Mar. 15/234.)

Nylon gears in sprinkler drive.—Injection-moulded nylon gears are meshing with a brass worm drive the oscillating-spray tube in a water-turbine-powered lawn sprinkler. Produced by Metallizing Engineering Co., Long Island, N.Y. ("Machine Design," 1950./Mar./119.)

MISCELLANEOUS

Ice-cream vending machine.—The vital parts of a new machine are made of phenolic plastics instead of metal, thus reducing the retail price by about 35 per cent. Ice-cream pops are issued at the drop of a coin, changes are made when necessary, and automatically four dispenser units from a large built-in storage space are reloaded. ("Materials and Methods," 1950/Mar./65.)

U.S. specifications.—G. Reinsmith surveys the specifications as developed during the past years by the various plastics producers and consumers as well as by Government agencies. ("A.S.T.M. Bulletin," 1950/Jan./78.)

Non-shrinkable thermosetting adhesive (Armstrong Products Co., Argonne Road, Warsaw, Ind.) does not contain volatile solvents and also does not swell when hardening. The material is supplied in two parts: a reddish brown rein composition and a liquid activator which are mixed together immediately before use. ("Product Engineering," 1950/Feb./174.)

Styrene plastics.—S. E. Gluk shows the wide application of polystyrene owing to its excellent dimensional stability and ease of fabrication. For special needs, modified styrenes are available. ("Product Engineering," 1950/Feb./81.)

Silicone surface coatings.—According to M. A. Glaster, modified silicone surface finishes offer a wide range of improved properties, including superior stability when exposed to heat, moisture and dieleotrical forces. Specification, physical and chemical properties are given. ("Product Engineering," 1950/Feb./109.)

Nylon made water repellent.—A silicon treatment applied to nylon fabrics, mixtures containing high percentages of nylon or acetate rayon, etc., makes them water repellent. The new material is a viscous high polymeric silicone containing 65 per cent. solids in a non-toxic, non-flammable solvent. ("Textile World," 1950/Feb./155.)

New expanded plastic is said to be useful as a lightweight insulator. Vinyl paste dispersions (Marvinol) are processed to form an expanded unicellular polyvinyl chloride composition with a weight from 2 to 12 lb./cu. ft. ("Product Engineering," 1950/Feb./182.)

Plastics versus Metals.—W. Schack compares the properties of metals with those of plastics, with particular reference to costs. ("Materials and Methods," 1950/Mar./49.)

Strength properties of plastics as influenced by testing speed.—A. G. H. Dietz and coll. made tension, compression and flexure tests under constant rates of ordinary strain, true strain, cross head motion and loading. ("A.S.T.M. Proc.," 1948/Vol. 48/1160.)

CHEMICAL

Plastics for corrosion protection.—W. Hawerkamp surveys in a well-illustrated article, acid-resistant plastics for the chemical industry. He gives a number of practical examples showing the rules for close collaboration between the chemical engineer and the maker of chemical plant. ("Kunststoffe," 1950/Jan./17.)

How wastes are disposed at a synthetic resin plant is the theme of an article by B. W. Dickerson. He deals with the separation of colophony acids and oils, phenol and formaldehyde by biological oxidation, using filters. ("Chemical Industries" (Philadelphia), 1949/Vol. 65/No. 1/38.)

Tube sealer and cutter.—A tube sealer has been developed for separating a plastic tube from a vessel used in "hot" radiochemical work. Tygan and Saran are used extensively. ("Nucleonics," 1950/Mar./66.)

Gaskets.—H. Saechtling deals with the deformation of soft plastic gasket materials in use. As this behaviour cannot normally be calculated, short-time tests have been made on sealing rings of various materials, giving a basis for evaluating these materials. ("Kunststoffe," 1950/Feb./49.)

Cadmium Pigments for P.V.C.

By R. BOVILLE WRIGHT*

CONSCIOUSLY or not, the general public has come, in recent years, to be appreciative of that essential balance of colour, texture, form and function—ever the keynote of true art—which is to be found in the best examples of modern plastics production. The part played by colours in the achievement of this combination is a major one, for surely in no other medium can they display such freshness, brilliance and depth, nor provide at will such subtle and delicate tints.

In making his contribution to the progress of the plastics industry, the colour technologist must keep pace with the rapid developments now being made in synthetic-resin chemistry, and must be able to meet them with contemporary advancements in colour technology. In order to fulfil the exacting demands of the public, and at the same time keep within the limitations imposed by the materials involved, the chemist must be familiar with the physical and chemical properties of the pigments he uses, as well as knowing their strength and tint.

This is particularly true in the colouring of vinyl resins, which, by virtue of their exceptional physical properties, are finding ready use in everyday service. In this particular field colour will assert a powerful influence on their ultimate success, and in the commercial exploitation of p.v.c. for upholstery, hand and travel bags, shoes, toys and fancy goods, the compounder must rigorously guard against the use of unsuitable pigments.

The acute shortage of rubber during and since the recent war was largely responsible for the rapid development of p.v.c. for domestic purposes. The remarkable clarity of the basic polymer offered encouraging possibilities to the colour technologist, but, as not infrequently happens with materials possessing the most advantageous properties, many problems had to be overcome before they could be brought to a suitable state for commercial service.

Initial experiments in the colouring of p.v.c. were made with rubber pigments and dyestuffs, largely because of the close resemblance between the methods of fabrication of the two materials. The majority of these pigments were, however, found quite unsuitable, and even pigments of recognized stability behaved in the most unpredictable way. This early research work and subsequent experience showed that the pigmentation of p.v.c. was to present more problems to the compounder than that of any other thermoplastic.

In examining the suitability of pigments for p.v.c., the compounder must not only be sure that the pigment is stable to light and heat, but also that it remains unaffected by exposure to low concentrations of anhydrous hydrochloric acid, which is liberated by the partial breakdown of the polymer at high temperatures. From the compounder's point of view, the pigments must also be easy to incorporate in the plastic mix; they must be economical in use, and must be readily available in unvarying strength and shade. The choice is further narrowed by the tendency of some pigments to initiate autocatalysis, with the resultant progressive degradation of the polymer.

A further factor no compounder can afford to ignore is the importance of the recovery of waste material, for the economic operation of the thermoplastic industry depends to some extent on the reprocessing of offcuts and waste from mills, calenders, and extrusion fabrication. The pigment should, therefore, not only resist initial milling and processing, but should also withstand repeated millings without deterioration. There are very few pigments indeed which will withstand these severe conditions.

It is now widely recognized that the inorganic pigments as a class are more dependable than the organic for the colouring of p.v.c. Outstanding among the inorganic pigments are the cadmium sulphides and sulpho-selenides, which provide a range of colours from greenish-yellow, through reddish-yellow, orange and red to maroon. These pigments have for many years been recognized as possessing exceptional light and heat stability and are now proving invaluable in the colouring of the vinyl resins.

Cadmium pigments prepared for the plastics industry are remarkably stable soft powders of fine particle size. They will withstand indefinite exposure to ultra-violet radiation and are unaffected by temperatures up to 500 degrees C. in air. By virtue of their remarkable fastness to light and resistance to elevated temperatures they find wide usage in other industries where these properties are of vital importance. Further, in common with most inorganic pigments, they do not migrate, are insoluble in industrial solvents, and are entirely unaffected by moisture. These properties alone are not sufficient to recommend them for use in p.v.c., since pigments for this application must also be resistant to low concentrations of anhydrous hydrochloric acid.

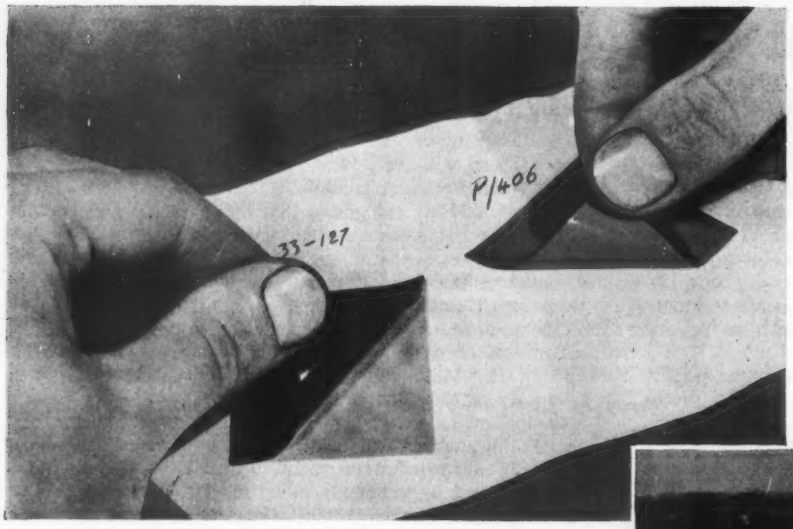
Cadmium pigments prepared for the colouring of synthetic resins have been subjected to exhaustive tests to ascertain their behaviour in the presence of a variety of stabilizers and plasticizers in test batches which have been milled at high temperatures for abnormally long periods. As a result it has been clearly established that cadmium pigments disperse readily in all types of medium, are completely unchanged in colour and have no deleterious effect on a normal p.v.c. formulation. A notable feature of cuttings taken at intervals during milling is the absence of flecks caused by aggregations of pigment particles.

It is here necessary to refer to the use of lead salts as lubricants and stabilizers. Whilst lead stearate, carbonate and silicate are very succesfully employed in p.v.c. in which yellow and red cadmium pigments are the colouring agent, it should be noted that lead has a strong affinity for sulphur and black lead sulphide is readily formed. It is essential, therefore, that particular care be exercised in the formulation of p.v.c. compounds which are to be pigmented with cadmium sulphide and cadmium sulpho-selenides.

It has been shown that under certain conditions, where insufficient attention has been paid to formulations, limited interaction between the cadmium sulphide and the lead compound can occur, resulting in the formation of traces of black lead sulphide with consequent darkening or discoloration. Irrespective of the presence of cadmium sulphide, the same formulations will be affected by hydrogen sulphide fumes in the atmosphere and a change of colour observed. The use of a leadless stabilizer is therefore recommended, or, if this is impracticable, the introduction of an easily decomposed cadmium salt, such as carbonate or stearate. If cadmium carbonate or stearate are present in the mix any free hydrogen sulphide will combine with this in preference to the lead, and yellow cadmium sulphide will be formed which will have no deleterious effect on the colour of the p.v.c.

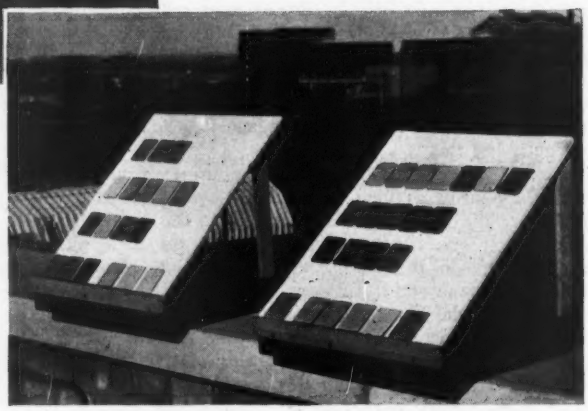
Testing light fastness by outdoor exposure of pigmented test pieces for prolonged periods is far more severe than accelerated light fastness tests. Generally speaking accelerated tests are of value in eliminating bad pigments, but they do not necessarily confirm the pigment as absolutely reliable in p.v.c. formulations. Incidentally, the prolonged outdoor exposure

* Johnson, Matthey and Co., Ltd., Hatton Garden, London, E.C.1.



(Left) Test for bleeding is carried out by placing pieces of pigmented p.v.c. in contact with white p.v.c. of the same formula, and keeping them under compression for one month at 20° C. The sample on the left shows that bleeding has taken place ; that on the right, no bleeding.

(Below) Fastness to light is checked by outdoor exposure of pigmented test pieces for prolonged periods.



test is of value in establishing that cadmium pigments have no deleterious effect on the ageing properties of p.v.c.

The resistance of pigments to attack by the action of sunlight, air and moisture is no less important than their stability during milling and processing. As a result of comprehensive exposure tests it can be stated that cadmium pigments are exceptionally resistant to sunlight, atmospheric fumes and moisture. In this connection the importance of correct formulation of the plastic mix should be mentioned, since if unsuitable plasticizers and stabilizers are used severe discoloration of the p.v.c. itself may occur. This discoloration may be mistaken for darkening caused by the decomposition of the pigment, and it is advisable, in order to observe any change in the basic colour of the resin, to introduce an unpigmented specimen to the exposure tests.

The problem of colour migration, or "bleeding," has long been an obstacle to the wider application of p.v.c. for domestic purposes, and has been largely responsible for bringing some plastic materials into disrepute. While it is possible that the particle size of the pigment and the incompatibility of ingredients in the compound may aggravate colour bleeding, the solubility of the pigments in the resin or the plasticizer is unquestionably the fundamental cause. Further, the solubility of a pigment may change between room temperature and processing temperature, and the pigment may even appear to have been successfully incorporated in the mix. It has been found that, although a p.v.c. coloured with pigments of varying solubility may appear to have passed a normal bleeding test, pronounced signs of bleeding may eventually become evident and the pigment particles may migrate to adjacent materials. Moreover, the problem of colour migration is affected by the deteriorating influence of p.v.c. formulations on the pigment and the varying pH value during processing.

The problem can only be avoided by ensuring that the colouring material employed is insoluble in the resin and the plasticizer under all conditions of processing. The cadmium sulphide and sulpho-selenide pigments are quite insoluble in normal plasticizers under all conditions of processing and are absolutely free from migration tendencies. Extensive trials have been made to confirm the complete absence of bleeding and chalking, and in no instance has migration of the colour been observed.

The remarkable expansion in the fabrication of p.v.c. during the past few years, and the increasing need for pigments for colouring this material, has been a great stimulant to the pigment research chemist. There has been an insistent demand for improvements in the consistency, brightness, covering power, and stability of the pigments employed. Additional problems have been created with the introduction of a new plasticizing technique, which has enabled the compounder to employ much higher temperatures than have previously been possible. This has often necessitated the replacement of many pigments which were quite satisfactory under early production conditions, but which were found to deteriorate rapidly on exposure to the new conditions.

The demand for pigments of superlative quality has been answered by considerable technical improvement in the colour industry, and to-day it is true to say that many pigments in popular use only a few years ago would be of little service in meeting present day demands.

This is certainly true of the cadmium pigments, where considerable progress has been made in manufacturing technique, and it is now possible to obtain pigments of exceptional brightness and strength. Because it has been found that maximum strength and brightness are incompatible in one pigment, cadmium pigments have been prepared which provide one range affording maximum strength and another affording maximum brightness. To increase still further the freedom of choice, there is a wide selection of co-precipitated lithopones, and an intermediate group of extended pigments prepared by the varying addition of barium sulphate. The comprehensive range of cadmium sulphide yellows manufactured vary in tint from primrose to orange, and the cadmium sulpho-selenides from light red to deep maroon.

Cadmium sulphide yellows have been known for their pigmentary properties for many years and were originally produced artificially well over a century ago. The commercial development of these pigments is, however, of far more recent origin; it is only within comparatively recent years that they have been brought to a suitable state for commercial service.

Cadmium reds were produced in this country when Johnson, Matthey and Co., Ltd., first succeeded in introducing selenium into cadmium sulphide to produce orange and red shades.

These pigments were found to possess the same high standard of heat and light stability as the yellow colours and were an invaluable contribution to the ceramics industry. Their remarkable light fastness and resistance to elevated temperatures attracted attention from other industries, and with advances in manufacturing technique they rapidly came into service for a wide range of commercial applications where drastic conditions of exposure were involved.

A rapid increase in demand for cadmium pigments during the past few years has followed the remarkable expansion in the synthetic resin industry. This has been largely responsible for the introduction of new and vastly improved pigments, made possible by active research and the development of new manufacturing methods. While it is possible to produce cadmium sulphide yellows by adding a soluble salt such as sodium sulphide to a solution of a cadmium salt, the product may vary from a dense brownish orange powder of negligible covering power to a light brilliant yellow of remarkable strength. The art of manufacturing these pigments lies in determining optimum manufacturing conditions and applying them rigorously to successive stages of production.

To-day, the production of the best grade of cadmium pigments is highly specialized and necessitates modern conditions of scientific control and the subjection of the pigments to severe tests to ensure their maximum strength relative to metal content, their freedom from impurities, and their consistency from batch to batch.

A high-grade cadmium pigment should be of fine particle size; it should contain no gritty particles or agglomerates. A simple test for evaluating the quality of a pigment of this type can be made by rubbing out a small quantity with a palette knife. A good quality pigment should not feel coarse against the knife and should show no streaks of concentrated colour when the knife is dragged over the surface of the pigment. The presence of numerous white specks or flakes will suggest a pigment which has been extended mechanically with barium sulphate but which has not been intimately mixed.

The use of a good quality cadmium pigment is essential if reliable results are to be obtained, and great care should be taken to avoid any which are likely to contain soluble salts or free sulphur.

A high-quality pure cadmium pigment should be free from added diluents, such as barium sulphate. Where an extended pigment is deliberately selected, mechanical mixtures should be avoided and a co-precipitated pigment based on the lithopone reaction should invariably be used. Such co-precipitated pigments are quite stable and free from risk of segregation of the extender, while they are tinctorially stronger relative to metal content.

Reflections on the 1950 Fair

(*Continued from page* 154.)

Plasticraft, Ltd. At this stand, too, which was devoted to toys and other fancy goods, the Royal Family was attracted by the colourful exhibits and bought several toys.

Stone and Simmons. Pioneers in the development of polystyrene wall tiles and with a reputation for having been courageous enough to export chop-sticks to Eastern markets, this concern is introducing new designs in household goods, including a novel mustard pot.

Thermo-Plastics Ltd. This well-known Dunstable concern, which originally specialized in sheet fabrication, has expanded to include all types of moulding; it still manages to fabricate and mould jobs, which few other concerns tackle. Thus on view were a large deep reinforced developing tank, a unique aircraft structure of glass-fibre laminate, ice-cream and wafer automatic dispensers and a new very large sign for Shell oil. This company has carved a very specialized path for itself with "Perspex" fabrications for the hygienic protection of food in snack-bars, hotels, etc. Rotating sandwich containers are exceptionally attractive and beautifully made. We shall deal further with this new endeavour in our next issue.

Triplex Safety Glass Co., Ltd. Probably the largest fabricators of acrylic and acetate sheet in the country, the Triplex plastic section are specializing in lighting fittings. Most noteworthy are the enclosed fittings for fluorescent tubes and the conical lanterns in reeded "Perspex."

Vinyl Products Ltd., and Vinatex Ltd. In addition to the p.v.c. sheeting produced, the "Vinamold" moulding material has assumed increasing importance. Viscosity and strength ranges have increased and a new type of heater for them has been developed by Controlled Equipments Ltd. A model "brain" and other biological models, advertising models and cornices produced from "Vinamold" moulds were on view.

Wallington, Weston and Co., Ltd. This company has entered the wall tile field with a very interesting type—the Muraplas tile—a thin tough laminate with a high-gloss vinyl surface. In addition, on view were "Sondahl" a new non-tracking insulating material and "Fromoprene" a laminate of resin-coated paper bonded with synthetic rubber used for the caps of condensers.

EXHIBITS AT CASTLE BROMWICH

Bakelite Ltd. This large and excellent stand portrayed the whole range of phenolic and urea moulding materials, synthetic adhesives, and laminates in all forms. Around the central stand were placed the units of the Bakelite Travelling Exhibition, which we first noted in London and which have also been seen in many European cities. Each unit describes the applications of Bakelite products in various industries.

Beetle Bond Ltd. This subsidiary of British Industrial Plastics Ltd. has strongly developed their urea and allied resins for the plywood and other wood-working industries and an additional speciality, W20, for the bonding of foundry cores. The exhibit featured the extremely high strength of structures obtained by bonds and jointing in these industries.

Birkbys Ltd. One of the oldest producers of phenolic resins of all types in the country and precision mouldings of high repute. On view at this stand was a complete range of their products produced under rigid specifications, in solid, powder and solution form, as insulating varnishes, cements and lacquers. Specialities are anti-friction resins for bearings and capping cements for the electrical industry. This company has also strongly developed synthetic resins for the paint industry.

Chemical Pipe and Vessel Co., Ltd. Examples of the welding of polythene and of rigid p.v.c. for the chemical industry were on view.

Holoplast Ltd. The new design of the "Holoplast" structure on the girder principle attracted much attention. This double laminate has now been developed so that complete partition walls can be dismantled rapidly with changing conditions in offices and other buildings and thus introduces extreme flexibility in interior building. The new "Corroplast" corrugated laminate for roofing was obviously popular to the building industry.

Ioco Ltd. The well-known "Formapex" laminates in sheet and tube form for electrical and industrial applications were in view, as were the gears, bearings and impeller blades made from them. The "Artoco" decorative laminates for walls and table tops, and a glass fabric laminate impregnated with silicone resin, were also seen.

Lacrinoid Products Ltd. The chief attraction on this stand were the amazing replicas made from cast resin using "Vinamoid" and "Welvic" moulds. Most attractive were the replicas of "wood carvings" for the furniture industry, umbrella handles and a copy of an ancient chess-set. Here also were seen components made from "Lacrinite," a lead-filled moulding material used to produce seal faces where dimensional stability, oil and water resistance, and self-lubricating properties are desirable.

Moulded Products Ltd. Interesting examples of this company's work were seen in the phenolic laminated fireman's helmet. This has passed specifications, is of great strength and much lighter than those made from leather. An excellent industrial moulding on view was the very deep-drawn unit for the Clipmaster clipping machine made from high-shock moulding compound. A new development by this company is a process enabling the production of relative small quantities of mouldings at low tooling costs.

Robert McArd and Co., Ltd. In addition to its specialized textile bobbin production, this company has concentrated on plastic lavatory seats of high quality and general engineering components. A new "Celmac" fitting to lavatory seats especially designed for children was on view; it is attached to standard models.

New Productions in Plastics

Street Lighting Unit

The new top-post mounting lantern on a 3-in. by 3-in. spigot has been introduced primarily for the lighting of side streets. This unit is totally enclosed in reeded " Perspex " of conical form, and has a pressing of diffusing opal " Perspex " to allow the light to fall immediately beneath the lantern. It was exhibited at the Birmingham B.I.F. by the General Electric Co., Ltd., and was also seen on the stand of the Triplex Safety Glass Co., Ltd., in the Plastics Section of the B.I.F. at Earls Court, London.

Hose Pipe

Melwood Thermoplastics, Ltd., Willoughby Road, Harpenden, Herts, are now producing this extruded p.v.c. hose pipe, which is very much lighter in weight than the usual rubber hose and is fully flexible and weatherproof. It is made in a full colour range and is supplied in standard lengths. Its non-furring and acid- and oil-resisting qualities are also points in its favour, for apart from garden use and car washing, this plastic hose may be employed for petrol feed pipes, lubrication oil pipes, air lines, and in plating shops.

Miniature Radio Set

The " Pixytone " radio set is built up from three identical hemispherical mouldings, each about 3½ ins. diameter, in pastel shade paper-filled urea-formaldehyde. Two of these mouldings, fitted together in the form of a globe, contain the miniature valves, tuning mechanism, etc. The third moulding forms the base, and at the same time acts as a housing for the loudspeaker. The control knobs are moulded in the same material; the tuning dial is of " Perspex." The set, which can operate on AC/DC mains or batteries, is produced by Ingleburn Products, Ltd., Malmesbury, Wilts. The mouldings are by the British Astral Co., Ltd., Southend-on-Sea.

New Toy

The " Woggle " horse, moulded in cellulose acetate exclusively for Woggle Sales, Ltd., 179-183, Staines Road, Hounslow, Middlesex, is one of a range of new toys which walk in characteristic manner (without aid of springs or clockwork mechanism) when placed on a slightly inclined surface. The jockey is made of synthetic rubber.

Battery Tester

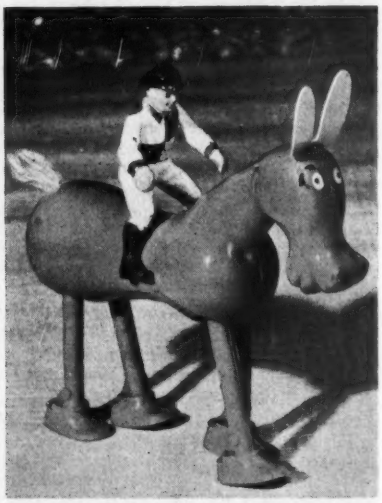
The " Davenset " high discharge battery tester, manufactured by Partridge, Wilson and Co., Ltd., represents a striking departure from traditional design. The main body of the tester consists of two mouldings in shock-resisting " Bakelite " material, characterized by high tensile, impact and cross-breaking strength, as well as good electrical properties. The bottom and top halves of the case, contact prongs, shunt and voltmeter are securely locked together and the motor is sprung within the moulded case. The tester is conveniently shaped in the form of a pistol, the butt of which is a solid moulding and comfortable to hold. The shunt, which places a heavy discharge of 100 to 140 amperes on the battery being tested, is carefully separated by a heat insulating barrier from the measuring instrument itself.

Fully Domed Buttons

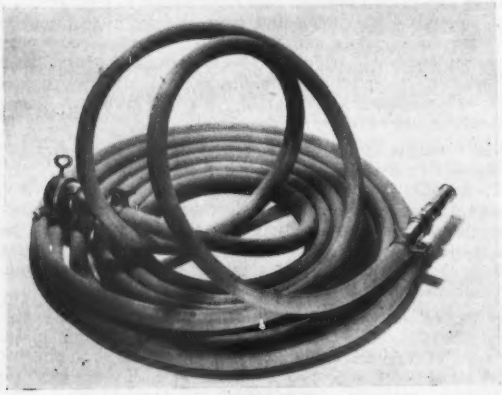
An advance in button moulding by United Ebonite and Lorival, Ltd., includes the introduction of fully domed buttons for men's outer wear. These buttons represent a development in design which will quickly be taken advantage of by clothing manufacturers. The fully domed backs of these buttons enable garments to be buttoned easily and materially assist easy setting and handling. A special machine used in the manufacture of these buttons ensures standardized and unvarying hole centres.

Street lighting unit (" Perspex").

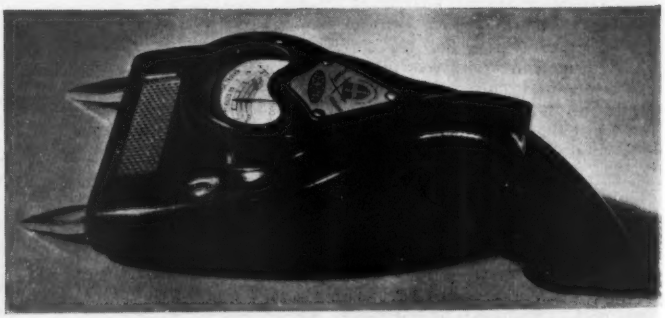
Miniature radio set (Urea).



(Right) New toy.



Hose pipe (extruded p.v.c.).



Battery tester (shock-resisting " Bakelite").

Child's Money Box

In imitation of a real lock-up safe, the "Peter Pan Bank" is provided with an outside keyhole, key, and spring-loaded lock. When the red polystyrene key is turned an internal lever releases a catch and the top flies open. The money box (excepting two springs) is made entirely of polystyrene, injection-moulded in yellow and red. The mouldings, for Cecil Coleman, Ltd., 136, Pentonville Road, London, N.1, are by Mentmore Manufacturing Co., Ltd., Plastics Division, Thornhill Road, Islington, London, N.1.

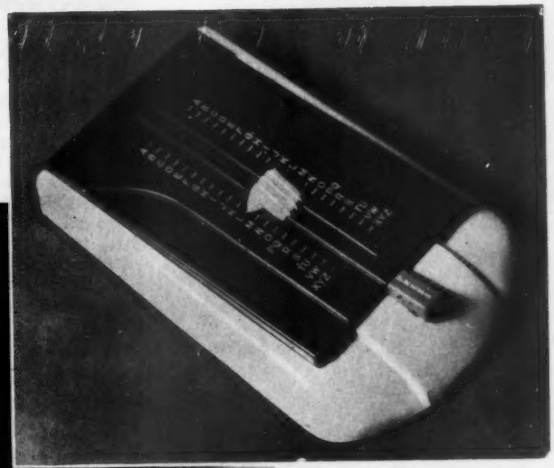
(Above) Child's Money Box (polystyrene)

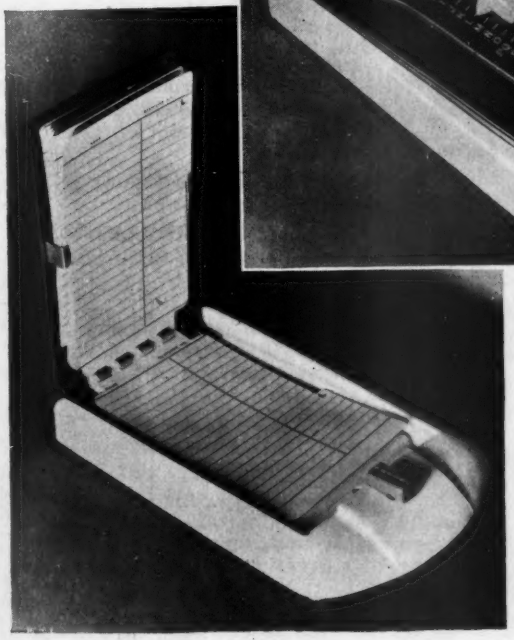
Telephone Index

The "Teledex" is a useful aid to business efficiency. By sliding the indicator to any selected position on the alphabetic scale marked on the lid, and then pressing a small button, the index flies open at the section containing names beginning with the selected letter. All the external parts are moulded. The base, in "ivory" urea, has clean curved lines and is easily kept free of dust. The lid may be moulded in the same colour, alternatively in a dark phenolic material, the letters on the scale being in a contrasting colour. The slide and the press-button are also compression-moulded components. Mouldings are by Insulators, Ltd., who also assemble the instrument for Paragon, Ltd. The general design of this unit is such that undesirable movement is impossible. It is not only a device of great utility, but equally a thing of remarkable beauty.

Switchgear for Domestic Appliances

(Right and below) Telephone Number Index (urea and phenolic)





Mustard Pot

A mustard pot shown for the first time this year at the B.I.F. by Stone and Simmons, 73-75, Mortimer Street, London, W.1, comprises a clear polystyrene pot from which the mustard is dispensed by means of a push-button mechanism in the cap, which depresses a plunger and forces a dab of mustard on to the plate. As the mustard is completely enclosed, it neither collects dust nor dries. The pot, lid and mechanism, comprising a total of six parts, are injection-moulded in clear and cream polystyrene.

Child's Watering Can

This small watering can, moulded in red cellulose acetate with yellow decorations, was seen in the Toy Section of the B.I.F. It is made by Wood and Kotek, Ltd., 56-58, Turnham Green Terrace, London, W.4.

Switchgear

As the result of co-operation between Moulded Products, Ltd., Chester Road, Tyburn, Birmingham, and one of the leading switchgear makers, domestic switchgear for electric cookers, and other appliances, is now available in colour. Our illustration shows a cooker switch of this type shown for the first time at the Birmingham Section of the B.I.F.

Mustard Pot (polystyrene)

(Right) Child's Watering Can (cellulose acetate)

LETTERS TO THE EDITOR

Correspondents are reminded that a stamped and addressed envelope should be enclosed in all cases where a personal answer is desired. It is understood that any letter received may be published at the discretion of the Editor.

Temporary Mechanical Protection of Materials and Equipment

Sir,—We were interested in the account of the "Cocoon" process described and illustrated in the article on "Thermoplastics for Temporary Mechanical Protection of Materials and Equipment," by E. E. Halls, in the April issue of "Plastics." We would, however, request space in your columns for certain corrections.

The statement in the first paragraph (page 102) should be reversed. The medium is manufactured by this company, and the equipment is available from paint-spray equipment manufacturers.

We would also correct the impression that large items cannot be completely enclosed. This has in fact been done, and still is, with aero engines and many other large units, the largest machines successfully treated being well over 30 ft. long.

Multi-ply cellulose webbing is the most suitable padding material.

The webbing solution is actually prepared not by dilution, as stated by Mr. Halls, but by the addition of a special webbing agent which is a patented composition.

The cementing of the window, as with the sealing to the bottom tray, is effected with a special synthetic resin emulsion adhesive and not with p.v.c.-base plastic, although the latter is used to produce the continuous skin on to the window.

We, ourselves, would not claim that the vinyl-based materials used in the "Cocoon" process will not affect thermoplastic surfaces. However, we may mention in passing that we have recently developed a material which can and is being applied to high-gloss cellulose lacquered panels, "Perspex" sheet and mouldings to protect them from scratch damage during handling and installation.

This company also markets a range of vinyl-based media capable of spray or dip application, whose strippability ranges from "very easy" to a point where a considerable load has to be applied to strip the film. The latter is of use as a permanent protective against acid smoke corrosion in steelwork, etc. A new dipping technique has also been developed which gives both mechanical and corrosion protection to steel stock and tools, etc., for many months in highly humid conditions. Humidity corrosion prevention is not possible by any other means with vinyl films of 0.002-in. thickness and below.

Finally, we would add that the word "Cocoon" is the registered trade mark of this company.

R. A. BRAND AND CO., LTD.
Ormonde House,
St. James's Street, S.W.1.

Scrap Urea and Casein

Sir,—Do you know where we could obtain scrap urea plastics or casein plastics which we could grind up to make a special nitrogenous fertilizer, or do you know of any firms supplying either of these materials already ground?

VITAX, LTD.
Burscough Bridge,
Ormskirk.

[EDITOR'S NOTE: We wonder whether or not the inquirer is confusing urea and casein plastics (that is, the cured material) with the original raw materials urea and casein. Urea itself is, we believe, already used as a fertilizer; certainly both urea and casein with their contained nitrogen, and in the latter case phosphorous, would be most suitable. On the other hand, we cannot imagine hardened urea-formaldehyde or casein-formaldehyde being at all amenable to attack by nitrifying bacteria within a reasonable period.]

Salt and Pepper Containers

Sir,—We send you an illustration of the kind of salt and pepper containers in which we are interested. If you can help us to trace a source of supply we should very much appreciate it.

V. M. GLYNN, LTD.
Coventry House,
South Place, E.C.2.

[EDITOR'S NOTE: This container appears to be one of the new type actuated by a press-stud in the head, the condiment issuing from the base.]

Welded Bags

Sir,—With reference to the Editor's Note to a letter published in "Plastics," May, 1950 (page 138), I would be glad if you would supply me with the names and addresses of the firms manufacturing welded bags in polythene and vinyl sheeting.

RAYMOND MATHER.
Minerva Laboratories,
Clodien Avenue, Cardiff.

Slide Buckles for Belts

Sir,—We are requiring supplies of plastic slide buckles for a line of ladies' dress belts which we are producing, the belting being ¾, 1 and 1¼ ins. wide. We envisage a rather decorative type.

THE ROTALAC CO.
Bridgewater Works,
Timperley, Cheshire.

P.V.C. Letters

Sir,—We would esteem it a favour if you could let us know the names and addresses of makers of p.v.c. "stick-on" letters for display use.

"LUSTERLITE" PRODUCTS.
Willow Terrace Road,
Fenton Street, Leeds, 1.

Plastic Hose

Sir,—Would you kindly send me the name and address of the manufacturers of plastic hose displayed recently at an exhibition in London and referred to in a news broadcast.

A. DALBY.
Flexbury House,
Bude, Cornwall.

Capsules for Incubator Control

Sir,—We are making the well-known "Electric Hen" incubators. So far, we are not satisfied with the mechanical thermostat which we are using, but we know that plastic manufacturers are moulding ether-type capsules for the control of bacteria incubators, where very fine temperature limits are necessary. Can you put us in touch with these manufacturers. Quantities required will be fairly large.

TURLEY AND WILLIAMS, LTD.
Highgate Street Works,
Birmingham, 12.

Plastic Tape

Sir,—We have an inquiry for a plastic tape similar to the sample which, as far as we can see, is composed of artificial silk warp threads, coated with p.v.c.

THOMAS FRENCH AND SONS, LTD.
Chester Road,
Manchester, 15.

[EDITOR'S NOTE: The sample sent by our correspondent, on account of the ridges on the outer edges, appeared at first sight to be an extrusion. Further examination suggests that it is a modified calendering job, followed by embossing.]

Clothes Pegs

Sir,—We would be very grateful if you could put us in touch with the manufacturers of plastic clothes pegs. We want to purchase these items in approximately 50-gross lots.

W. MARTIN JAMES, LTD.
Redditch.

Cellulose Sheets

Sir,—We are interested in the purchase of celluloid sheets, both transparent and coloured, in 30- and 40-thou. thicknesses, together with various solvents for same.

MOBBS AND LEWIS, LTD.
Carrington Works,
Kettering.

Bobbins

Sir,—We would like to obtain a list of the most important of the U.K. manufacturers of plastic bobbins for the textile industry, with particular reference to the jute-manufacturing section of same.

INDIAN JUTE MILLS ASSOCIATION
RESEARCH INSTITUTE.
Baltic House,
Leadenhall Street, E.C.3.

PRODUCTION NEWS

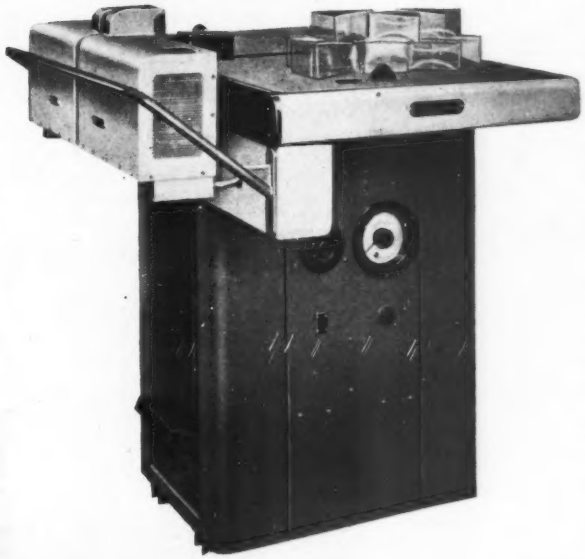
Raw Materials, New Plant, Works Organization, Control Apparatus, Research, Personal and Trade Notes

CONTROL SYSTEM.—Elliott Brothers (London), Ltd., Lewisham, S.E.16, have sent us a copy of their publication dealing with the "Elliottral" trimode controller, which is a new system of automatic process control which was shown at the B.I.F. in London and Birmingham. Design of automatic process control equipment has hitherto been centred largely around primary measuring instruments. The trimode controller, however, is essentially a pneumatic device, which may be located remotely from the measuring instrument or recorder with which it is associated. This marks a distinct departure from current practice in which the controller and measuring instrument have to be built into the same case. It therefore introduces a new degree of flexibility into the layout of the control installation. The output is a variable pneumatic pressure suitable for positioning any of the usual types of diaphragm-operated process regulators. Remote control is achieved by eliminating a mechanical link for transmitting the error or deviation signal to the controller and replacing it by an electrical or pneumatic link. Irrespective of whether the controller is housed in the same case as the measuring instrument or remote from it, the use of a single air line or a twin electrical lead is far simpler than any form of mechanical linkage and has no possibility of misalignment.

TEMPERATURE CONTROL.—A new system of temperature control, having wide applications both in industry and in the laboratory, was exhibited at the Birmingham Section of the B.I.F. by P.A.M., Ltd., of Merrow, Guildford, Surrey.

The instrument consists of a robust sensitive element in which the differential expansion of two metals operates a contact, which interrupts or passes a minute current, a special electronic amplifier, making this current operate a 2½ kW relay. As the amount of movement required at the contact faces is very small (approximately 0.000002 in.), extremely sensitive and positive control results, using either large or small sensitive elements.

The value of the "Tem-Con" system of temperature control in the plastics field is its adaptability, making it particularly suitable for problems where accurate and positive control is required in restricted spaces. Practical application has shown that control to within +0.2 degrees C, can be satisfactorily obtained.



BOX WELDER.—This new machine by Redifon, Ltd., Broomhill Road, Wandsworth, London, S.W.18, will weld boxes and lids of square or rectangular shape, ranging in size from 1½ ins. by 1½ ins. by ¼ in. to 20 ins. by 12 ins. by 5 ins., using cellulose acetate sheet blanks, which can (if desired) be printed before the welding operation.

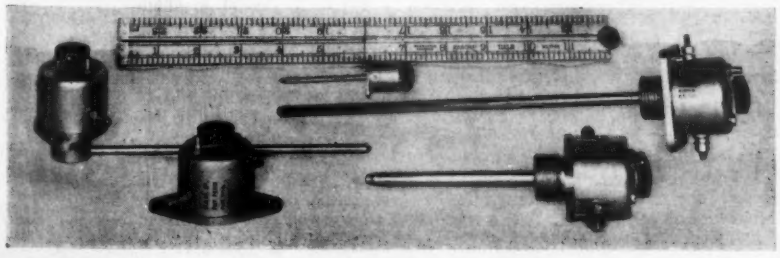
The machine is easy to set up, and does not require a highly trained operator. Change of production from boxes to lids can be effected in a few minutes, and an average output of 300 completed medium-size boxes per hour is a comfortable minimum for any operator.

Regarding the method of operation, a pre-folded blank is placed on a former and the pedal of the welder is depressed; this results in the closing of the two electrode systems, applications of pressure, and welding with automatic timing. After the pedal is released, the former holding the box is rotated through 180 degrees, and the operation is repeated to weld the two remaining seams. The finished box is then removed from the former, and the next blank is inserted. Welding times can be pre-set by means of an automatic synchronous motor-driven timer, and are of the order of seconds, depending on the thickness of material.

Cellulose acetate is more critical with regard to high-frequency welding than other thermoplastics. It is essential to supply high-frequency power at the lowest possible voltage in order to avoid breakdown due to arcing or surface discharge. A very high operating frequency of more than 100 Mc/s has been adopted for this welder in order to ensure the safe application of power to materials having comparatively low electrical breakdown strength. Two self-contained H.F. power units are provided, each unit supplying power for the welding of one seam. Apart from power control, no further adjustments are required when changing the size of box produced.

Every precaution is taken to avoid the possibility of electric shocks or burns. Side inspection panels carry interlocks, so that their removal cuts off all current above mains voltage. R.F. filters are fitted in the mains circuit, and generators are completely screened.

This new welder is being demonstrated at an exhibition of cellulose acetate plastics and some of their applications, which is being held by British Celanese, Ltd., at Celanese House, Hanover Square, London, W.1, and will remain open until June 16.



P.A.M. temperature control: (Left) Typical sensitive elements and (above) three-circuit amplifier for use with these elements.

CARBIDE TOOLS.—A new catalogue (56 pages) of "Cutanit" cemented carbide tools and tips to revised standard shapes and sizes has been issued by William Jessop and Sons, Ltd., and J. J. Saville and Co., Ltd., of Sheffield. The revision has been made in order to reduce very considerably the number of standards and to bring tool and tip shapes and sizes into line with modern machine shop practice. Hitherto the main item of "Cutanit" literature has taken the form of a Service Handbook. This will appear shortly in a more up-to-date form.

WICKMAN DEMONSTRATION UNIT. Continuing the programme of overseas demonstrations for which the Wickman Mobile Demonstration Unit was introduced last year, this unit left for the Continent on April 12. A programme of demonstrations has been arranged in France, Italy, Switzerland, Germany, Holland, Denmark and Norway. Particulars can be obtained on application to A. C. Wickman, Ltd., Tile Hill, Coventry.

STANDARDIZED INJECTION MOULDS.—The German Standards Institution has issued a draft standard DIN 16751 on moulds for injection machines up to 50 cu. cm. press capacity. The thickness of the flanges is not fixed, but the injection cone has a base diameter of 20 mm. and an included angle of 90 deg.

D.S.I.R.—The headquarters of the Department of Scientific and Industrial Research has moved to Charles House, 5-11, Regent Street, London, S.W.1. The telephone number is still Whitehall 9788.

INDUSTRIAL FINISHES EXHIBITION.—A novel idea at the forthcoming Industrial Finishes Exhibition, to be held at Earls Court, London, August 30 to September 7, is that many of the exhibits will be working models, where persons who are interested will be able to try out the processes on their own particular samples. Many entirely new developments will be shown, including electrostatic spray painting, electrostatic de-tearing, paint testing and instrumentation. This is the first time that the finishing industry has had an exhibition devoted exclusively to itself.

FILM AND SHEETING CONFERENCE.—Merchandising and manufacturing were emphasized at the first Plastics Film and Sheeting Conference sponsored by the Society of the Plastics Industry, Inc., held on May 25 and 26 in New York. This conference is an outgrowth of the work of the SPI Plastics Film, Sheeting and Coated Fabrics Division, which was organized four years ago with only seven companies in it. To-day there are 75 companies, with approximately 150 of their representatives participating in this Division's activities. Back in March, 1946, the first month this Division was organized, the production of plastic film and sheeting produced in the United States was 2,161,230 lb. For April, 1950, the production of these products was estimated to be approximately 13,000,000 lb., said Mr. W. T. Cruse, executive vice-president of the Society.

MELWOOD THERMOPLASTICS, LTD., announce a change of address to Willoughby Road, Harpenden, Herts. (Telephone: Harpenden 300.)

O. AND M. KLEEMANN, LTD., have announced an interim dividend on the ordinary stock of 25 per cent., less income tax, for the year ending August 31, 1950 (compared with 70 per cent. for the previous year). In announcing this interim dividend the Board of Directors draw attention to the fact that in his speech at the annual general meeting in December, the Chairman pointed out that the turnover for the first three months of the company's year showed a decrease compared with the same period of the previous year, and that if conditions then prevailing continued for the remainder of the year, the profits for the current year would be substantially lower. While considering it prudent to pursue a conservative policy with regard to dividends, in existing conditions the profits for the past half-year are, therefore, thought to be satisfactory.

GREENWICH LEATHERCLOTH CO., LTD.—At a private trade exhibition held at the Athenæum Court Hotel, Piccadilly, London, W.1, this company showed their range of p.v.c. sheeting and leathercloth, and finished goods showing the end uses of these materials. Examples of sheeting included a special design, printed by the Kleinert Rubber Co., for shower curtains on the Cunard White Star liners. Among other exhibits was a children's picture book manufactured by Beechfield Products, Ltd., with Walt Disney characters printed on double vinyl sheets, each page having an inflatable toy. "Craytube," extruded p.v.c. tubing for use as a watering hose, is a new production of the Greenwich Leathercloth Co., Ltd.

BRITISH MOULDED PLASTICS, LTD., announce that they have taken over the sale of the battery lids and plugs of Xenit Products, Ltd., Trading Estate, Slough, as from June 1, 1950, and are the sole selling agents.

STYRENE PRODUCTS, LTD., has been registered as a private company with a capital of £200,000. The new company is a joint interest of Petrochemicals, Ltd., and Erinoid, Ltd., and will produce polystyrene from the monomer for use in Erinoid plastics.

BRITISH PAINTS, LTD., have changed the address of their London office from Leadenhall Street to Crewe House, 15, Curzon Street, London, W.1. (Telephone: Grosvenor 6401-5.)

GOLDEN VALLEY COLOURS, LTD., Wick, Bristol, have opened a London office at 31, Norfolk Place, W.2. (Telephone: Paddington 2597.) The office will be in the charge of Mr. W. G. Wade, a director who has been associated with the company for 20 years.

THE PLASTICS INSTITUTE informs us that their telephone number at the Adelphi, Adam Street, London, W.C.2, has been changed to Trafalgar 3632.

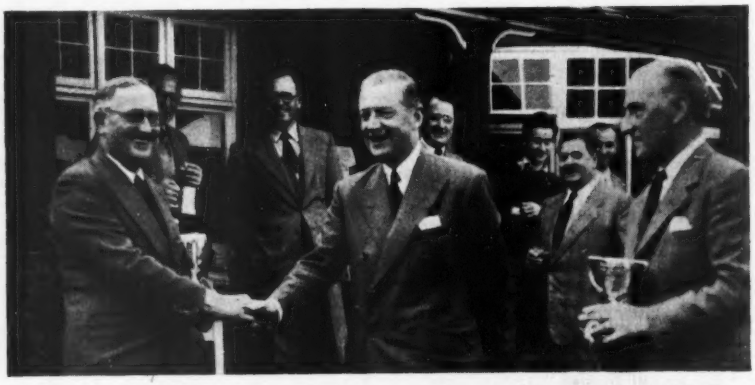
TECHNICAL COLLEGE AWARDS.—Mr. Thomas H. Grant, chief engineer of British Industrial Plastics, Ltd., received an Honorary Associateship of the Birmingham Central Technical College. Miss Mary Cornforth, drawing office assistant at the physical testing laboratories of Bakelite, Ltd., at Tyseley, Birmingham, is the only woman to receive an Associateship of the college this year.

MR. MAURICE BROWN has resigned from his position as sales manager to Plastic Engineers, Ltd., and Plastic Fashions, Ltd., with effect from May 31, 1950. He has now taken up an appointment as export sales manager with Mitchel Maer, Ltd., 11, Berkeley Street, W.1.

RAIL FREIGHT.—I.C.I. Plastics Division inform us that it is not the intention of this Division to increase the price of their products where the impending increases in rail freight are imposed.

DOLLAR EXPORT INQUIRY.—Mr. Philip Stibbe, of the P. and E. Sales Co., 3863 West 25th Street, Cleveland, Ohio, is desirous of representing British manufacturers of plastic packagings, such as boxes for shoes and slippers and containers for other merchandise.

BAKELITE SPORTS FOOTBALL CLUB, captained by W. Musgrave, won the "Birmingham Mail" Sports Final Challenge Cup, 2-0, playing against Tangye's, Ltd., Recreation F.C., at Villa Park, Aston. The cup was presented by Mr. E. M. Clayson, managing director of Birmingham Mail, Ltd., at a dinner following the match at Holte Hotel, Aston. Sir Basil Tangye was in the chair.



P.I.G.S.—The Plastics Industry Golfing Society held a meeting at West Hill on May 23 to compete for the Airborne Trophy and the "Plastics" Goblets. Fifty members and visitors attended.

The Airborne Trophy (bogey), presented by Mr. John Ferguson, was won by P. Smith (two up on bogey). The runners-up were T. G. Brooke-Hitching, T. J. Finch and L. F. Bull (one down). Winning visitor: P. Last (one down).

The "Plastics" Goblets (Stapleford Foursomes), presented by Mr. Roland E. Dangerfield, chairman and managing director of Temple Press Ltd., was won by C. C. Last and S. Turner (32 points), the tie being decided on the last nine holes. The runners-up were G. J. Taylor and H. F. Judd (32 points). Winning visitors: N. Hanbury and M. Murdoch (31 points).

Our photograph shows Mr. Dangerfield congratulating Mr. Last (left) and Mr. Turner (right) at the presentation of the "Plastics" Goblets.

Successful Designing for Plastics Moulding—XI

By W. M. HALLIDAY

In this article attention is given to the vitally important questions surrounding the selection and location of mould parting-lines, and the resultant flash-lines to be formed on the component. Typical examples are presented of various component design forms to illustrate the reasons for the choice of certain preferred types of parting-line location. These examples demonstrate clearly the important relationship between the situation of mould parting-lines and the position and degree of flash formed on the moulded article.

THE most satisfactory location of flash lines upon the surface of a proposed moulded component is a question very often of the greatest importance, which the designer will have to decide before finalizing the design form of the projected component.

With both compression and injection moulded components some degree of flash will be caused usually in the form of a raised fin, whose thickness will vary according to the quality of the moulding tool.

Effects of Flash

Flash formed on the *external* sides of a component will prove deleterious, either in respect of the obvious detraction in the quality of surface finish arising therefrom, or because additional operations and expense will be incurred in the removal and trimming of such flashes, after the part has left the mould.

Flashings of an excessive scale which are formed on the sides of injection-moulded components may also incur considerable delay and difficulty during the actual moulding, particularly in regard to the extraction of the cores, and the ejection of the finished article from the mould cavity. Flash of this kind may cause the component to hang in the cavity, or to adhere too stringently to core plugs, thereby slowing down the operation of the mould.

Even though it may prove easily possible to remove flashings from a component, a slight scar generally remains, this being visible as an unsightly surface blemish on the side of the moulding. The thicker the flash, the greater the tendency towards such scar formation. Thick flash is also more difficult to remove and generally will require a special die. On the other hand, very thin flash, e.g., not exceeding .003 in., may sometimes be removed without the use of the trimming tool, merely by rumbling in a small revolving barrel. With this method considerable quantities of small mouldings may be de-flashed at the same time.

It has to be borne in mind that all plastics moulds have to be made in at least two parts, often many more. This is required because the toolmaker must be afforded proper access to the main elements of the mould when producing the cavity formations, and later in order that the finished mouldings can be readily extracted.

The main members of the moulding tool, therefore, have to be matched together on what is known as the parting-line, and some marking or slight flash coincident with these jointed surfaces will unavoidably be produced on the sides of the component.

If a moulded component has to fulfil mainly a decorative or ornamental function, the attainment of which requires an external surface free from all blemish or disfigurement, the determination of the mould parting will assume the greatest importance, and, indeed, may often become the overriding factor governing the design form to be employed.

The mould parting-line in relationship to the desired high-quality surface finish on the component will have to be selected with the greatest of care, so that flashings can be arranged to occur at unimportant situations, and also in the smallest magnitude practicable.

Moulded components, too, have very often to be produced having certain dimensions to be held within precision limits of error or variation. Undesirable variations in sizes may often accrue as a result of injudicious location of mould parting-lines. Sometimes, however, the design forms stipulated on the component will render it impossible for the designer to make the best selection of parting location in the mould to preserve dimensional accuracy in the above way.

The disposition of the parting-line in the mould, whilst in the main determined by the type of moulded component to be produced, will have a considerable influence upon the complexity or otherwise of the general design of the moulding tool.

Similarly, the economical operation of the mould may be influenced in no small measure by the type and location of parting-line which can be employed. For instance, if the mould has to be made with an *irregular* kind of parting-line, involving the sealage of the main blocks in two or more planes, not only will the cost of the tool be increased, but its speed of operation may be affected. Thus arising directly out of this factor, the unit cost of the mouldings themselves may be increased.

These latter requirements will often arise in the most acute form with injection mouldings, in so far as the incorrect or unsatisfactory determination of parting-line in the mould, may give rise to numerous operation snags, chiefly concerned with the ejection of the components in a safe, economical, and rapid manner.

The location and form of parting-line used in an injection-type mould will also exert some influence upon the runner system which may be employed. Usually runner channels and gates leading from the sprue to the cavity have to be machined in one or both the parting-line surfaces. If this surface is irregular, or of some other awkward shape, it may prove difficult for the toolmaker to locate the runners and gates in the best position for feeding the cavity.

In view, therefore, of the critical relationship existing between the disposition of the mould parting-line and the flash lines reproduced on the component, it will be logical for the designer to consider carefully how the resulting unavoidable flash lines, can be minimized or disposed on relatively unimportant surfaces. In addition, he must consider how such flashings can best be removed, by the simplest trimming tools or methods and, of course, at the lowest practicable cost. To this end it will be necessary to limit the number of parting-lines in the mould as stringently as possible. For preference only one should be used.

The parting-line or lines in the mould should lie along straight, flat surfaces, or alternatively to follow the simplest geometrical shapes. Wherever possible it will be advisable to locate the parting-line to conform with an edge of the component being moulded, or upon a suitably raised projection thereon.

This type of location, whilst producing a flash, does at least ensure that it can be removed expeditiously and inexpensively. Moreover, if the flash lies at an extreme edge of the component it will be possible usually to remove it without inflicting damage upon the remainder of the surface, as would be likely to occur if the flash were to be situated well back from the edge, for instance.

Endeavours should be made to avoid introducing slides, cores and slide-guideways, or similar movable members, in such a manner that these intersect into the cavity formation. With such movable elements it will be impossible to ensure an absolutely tight sealing fit between them and the mould block, and as a result, should these project right into the cavity, additional flashing will be bound to occur by the interstices permitted on the joints.

In an earlier section a number of general rules governing the selection of parting-lines in both injection and com-

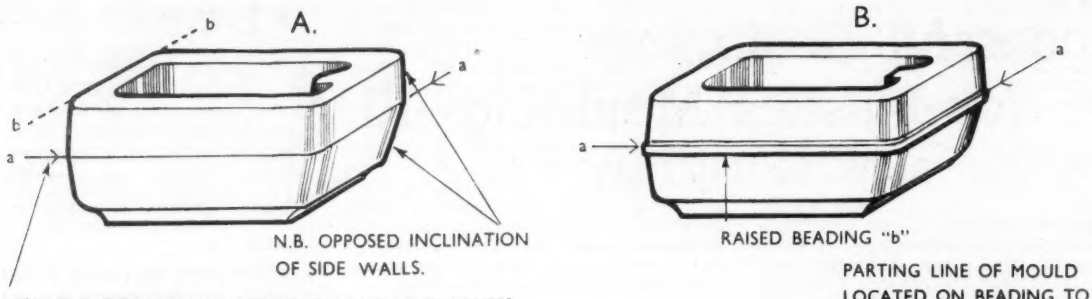


Fig. 1.—Two designs for a simple moulded component.

pression moulds were given. It remains now to illustrate the application of those rules by a number of practical examples.

Examples of Parting-line Location

Referring to the illustrations, two views are depicted (Fig. 1), of a simple moulded component which basically is a very commonly used shape.

The first view at A shows this rectangular box component, from which it should be particularly noted that the external sides are not perfectly flat and at right angles to the base or top edges. Instead, all the sides are inclined for half their height back from the transverse centre of the part, or, in other words, from the line "a—a." This requirement entails splitting the injection moulding tool along that line "a—a," in order that the part can be extracted from the mould, which feature of course could not be accomplished if the mould were to be parted along the top edge of the article as denoted by the light broken line "b—b."

This component design would issue from the mould with a flashing around the four sides coincident with the line "a—a." Moreover, the runner and gate would be joined to this portion in the case of an injection moulding, since these elements would have to be machined in the parting-line surface of the mould block.

Should a component of this type be made in a thermosetting material by compression moulding, the mould would be parted along line "a—a" as before, thus giving rise to the creation of a flash line at that point of the component surface. Care would have to be taken when loading and operating the mould to ensure that such flash be kept to a minimum thickness because of the necessity to keep the resulting scar as small as possible.

This parting-line location is not to be recommended, because it will prove somewhat difficult to remove the flashings without inflicting some damage to the smoothly polished surfaces of the component.

A much more satisfactory design form is shown at B (Fig. 1). This depicts the same box moulding which has been slightly modified in external shape so as to simplify the removal of flash. This modification consists of the provision of a simple beading "b" formed to project a slight amount above the general level of the component wall at the point indicated. This beading is extended across all the four sides of the part.

The parting-line of the mould is situated at the top edge of this beading as denoted by line "a—a." The shape of beading employed is of trapezoidal form having a flat crest. If desired, however, a semi-spherical shape of beading may be employed, which, incidentally, would probably give superior surface appearance to the part. If a beading of this latter shape were to be adopted, however, it would be necessary to locate the mould parting-line "a—a" so that it would lie on the crest of the curved portion exactly central with the width of the beading.

The use of a beading of this common shape will also entail rather more tooling during the manufacture of the mould, because it will be necessary to machine half of the beading section, in reverse form, into each mould block, at their parting line surfaces.

Considerable care would have to be taken when performing this operation, owing to the fact that a critical matching-up requirement will arise to ensure that each portion of the beading is truly aligned with the other when the mould is closed.

Provision of beadings of this character will usually be more simple and economically accomplished, however, because full access will be afforded to the toolmaker when reproducing these portions of the cavity, since an enlargement of the mouth of the cavity in one or both blocks, at the parting-line surface will be the only additional tooling required.

Not only will the presence of such a beading allow the flash thereon to be much more easily removed by a trimming die, shaving tool, or similar means, but any slight scar remaining will not be as prominently visible, as is the case with the preceding example shown at A.

In practice, the use of external beadings for the purpose of locating flash lines, and hiding resultant markings the better, is often resorted to by mould designers in those circumstances where some latitude is permitted them to modify the component design.

Irregular Flash Lines

The illustrations given at Fig. 2 indicate the numerous disadvantageous features surrounding the adoption of irregular or awkwardly disposed flash lines on a component and similarly difficult parting-lines in a mould.

The first example, shown at A, depicts a somewhat unusual type of moulding design, of a hollow component, which has to be moulded closed at the bottom (straight) side. The upper (open) end, however, is of rather a complicated shape, comprising two short flat portions, at different heights from the base, and interposed between these portions is a curved part of substantial radius and length. Two small steps, one inclined and the other perfectly square, are also to be provided where the curved portion joins to the highest flat on the end of the moulding.

The mould would have to be parted along the line "a—a," whose lay-out would coincide with the above-mentioned different contours. An irregular or uneven parting-line of this character will be rather difficult to reproduce in the mould. Its manufacture would certainly entail a considerable increase in machining, tooling and fitting, because it will be essential to ensure a close seal throughout these irregular surfaces in the respective blocks. Thus the cost of a mould of this nature would be very greatly increased.

Flashings would be formed on the end of the moulded article along the line "a—a." The effective removal of such flash would require an intricate trimming tool comprising a punch and die, the mouldings being pushed through the latter. This die would have an opening conforming accurately to the outline of the moulding along line "a—a," and of itself this tool would be expensive to manufacture.

Unless such a die possessed great accuracy there would be a danger of eventually snipping off the sharp corner of the wall when the flash was removed.

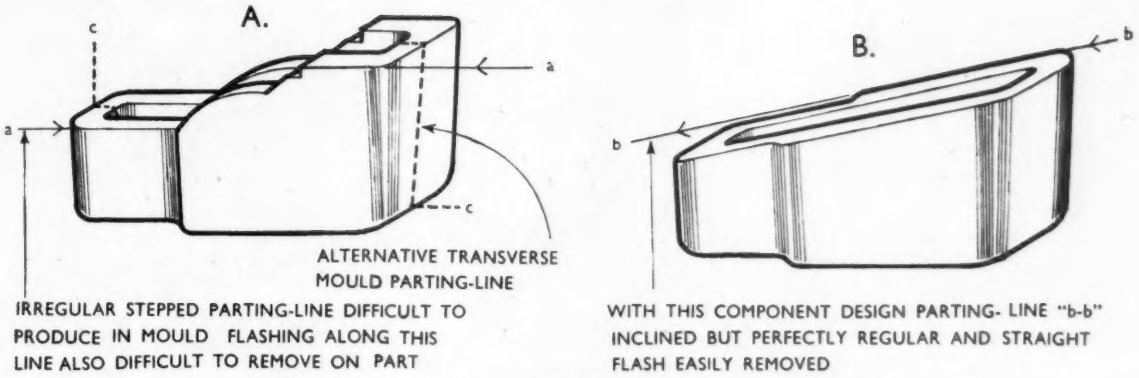


Fig. 2.—Disadvantageous features of irregular or awkwardly disposed flash lines.

This would be particularly prone to occur if the flash were of undue thickness, or the trimming tool had become worn on its cutting edges.

Furthermore, the greatest care would have to be observed when making such a trimming die to obviate scoring or marking the plain sides of the moulding when passing it through the die opening. It would be necessary to provide a considerable degree of draft or taper on the sides of the component, to ensure that the portions below the line "a—a" would pass freely into the die opening.

The modified component design form depicted at B (Fig. 2) is a much superior and simpler shape, and the above-mentioned production and mould manufacturing snags would not arise.

With this design form it will be seen that the irregular upper edge has been completely eliminated, being substituted for a plain inclined edge, which is perfectly flat. In the first place the task of mould manufacture, and especially the questions of matching up the two mould blocks for sealing, will be considerably simplified. It will be obvious that the tasks of the toolmaker when machining a pair of blocks having a parting-line lying in a single inclined plane as shown at "b—b" will be immeasurably simpler than with the previous example.

The flashings formed along line "b—b" may be removed without passing the component through a shaving die at all. By simply applying the part to a moving sanding belt of the endless type, for linishing the top inclined edge of the part, such flashings will be very quickly removed.

The sharp corner at the junction of the vertical walls and the inclined top edge would be maintained in a very accurate manner. No damage or disfigurement would be inflicted upon the surfaces of the vertical sides of the component because trimming by the usual tool or die methods would be entirely obviated.

The savings effected in the initial cost of mould manufacture would also prove considerable in comparison with those involved in the reproduction of a moulding design form of the kind shown at A.

Irregular or difficult parting-lines in a mould should, therefore, always be very carefully considered before a final selection is made, and mould manufacture is commenced. If possible the component shape should be modified to achieve the greatest simplification of the mould parting, and the location of any flash at the most accessible point.

There would be no advantage gained by employing a beading in connection with the design shown at A, since the degree of irregularity in shape would in no wise be diminished, and the toolmaker would still have to machine the necessary cavity formations with the closest precision to produce an accurate match and close seal. A beading could, however, be much more easily introduced in the case of the example shown at B, and an improvement in the general appearance of the component would undoubtedly be effected.

It would, of course, be feasible for the mould designer to reproduce a component shape as depicted at A in another manner, by disposing the mould parting-line transversely around the component instead of along the top edge, after the fashion denoted by the heavy broken line "c—c." Should this be adopted, however, a cavity formation equivalent to half the component shape would be required in each mould block. A very accurate matching-up operation would thus be created when aligning the respective stepped or irregular shaped portions of the mould.

In addition, the flashings occurring on the finished component would lie along the line "c—c," extending in fact across the centre of the base and along the middle of each vertical end-face of the component. It would be practically impossible to remove such flashings without leaving some slight markings on the side of the component to detract from its appearance. The risks of scoring or otherwise disfiguring the surfaces of the remaining portions of the wall, at each side of the line "c—c," would also be greatly increased.

A component planned along these lines would, of course, have to be trimmed in a shaving die, and again due care would have to be constantly exercised by the operator when placing components into position prior to shaving off the flash. Should a component inadvertently be located out of line in this shaving die it may be found that a wider and deeper cut will be taken at one side than the other, and a portion of the flash might remain on one side, whilst an excessive amount of stock would be removed from the opposite side.

With such a mould parting-line layout, considerable difficulties would be occasioned respecting the location and operation of the core plug necessary for the formation of the hollow internal configuration in the part. Unlike the case with the mould designs for producing components of the previously explained character, this core plug could not be fixed within one mould block, and the component ejected therefrom after the mould blocks have been parted in the normal manner. This core plug would have to be movable, by being carried in a slide for instance.

This core plug would also have to be withdrawn from the cavity area before the mould blocks could be opened. Such a requirement would undoubtedly incur a longer operating cycle with either a compression or injection moulding tool, and therefore operating costs would be increased in contrast to those attending the use of a simpler form of mould design previously mentioned.

From these considerations it will be evident how vitally important it is for the mould designer to make a wise selection of parting-line disposition, shape, etc., to facilitate which he should be accorded the maximum degree of discretion respecting modification of the component design and shape, so that the simplest forms can be chosen.

The advantages to be derived from a simple type of mould parting are many and extremely valuable, and are chiefly connected with reduced manufacturing costs, quicker removal of flashings, and improved appearance of the components.

(To be continued)

PATENT REVIEW

The following abstracts have been made from specifications at the Patent Office, with the permission of the Controller of H.M. Stationery Office. Complete specifications can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 2/- each.

B.P. 634,808. Appl. 7.7.47. Conv. (U.S.A.) 26.2.47. Acc. 29.3.50.
Cellulose ether compositions. R. W. Ivett and W. W. Koch. To: Hercules Powder Co.
Stabilization of cellulose ethers with di-isobutyl phenol.

B.P. 634,850. Appl. 30.11.46. Conv. (Germany) 22.6.44. Acc. 29.3.50.
Injection moulding of plastic materials. V. Vltavsky.
Injection moulding machine with single hydraulic press utilized for feeding material into the mould and providing moulding pressure subsequently.

B.P. 634,853. Appl. 19.3.47. Acc. 29.3.50.
Improvements in or relating to injection moulding machines. D. Anderson.
Improved design of nozzles for injection moulding machines.

B.P. 634,960. Appl. 23.12.47. Acc. 29.3.50.
Methylol pentadecyl phenol and its derivatives. E. R. H. Jones and I. K. M. Robson. To: British Resin Products, Ltd.
New compound which is resinifiable by heat and can be used for moulding compositions.

B.P. 634,986. Appl. 5.2.46. Conv. (U.S.A.) 9.6.45. Acc. 29.3.50.
Resin emulsion base wrinkle composition. N. T. Beynon.
Wrinkle drying coating composition containing a resin such as acrylic ester, polyvinyl acetate, melamine or urea formaldehyde.

B.P. 635,010. Appl. 29.4.47. Conv. (U.S.A.) 15.5.46. Acc. 29.3.50.
Moulded or laminated asbestos products and method of producing same. C. S. Maxwell. To: American Cyanamid Co.
A water suspension of asbestos fibre is treated with a colloidal aqueous solution of partially polymerized negatively charged dimethylol urea resin (see B.P. 608,487), and moulded under heat and pressure.

B.P. 635,011. Appl. 30.4.47. Conv. (U.S.A.) 1.5.46. Acc. 29.3.50.
Vinyl resin compositions. F. Johnston and W. H. Hensley. To: Carbide and Carbon Chemicals Corp.
Vinyl resin compositions comprising a vinyl chloride polymer or copolymer and a di-ester amide.

B.P. 635,034. Appl. 2.1.48. Acc. 29.3.50.
Dimensional stabilization of cellulosic textile materials. R. J. Smith and C. D. Weston. To: Imperial Chemical Industries, Ltd.
Impregnation of rayon materials with a solution of Pyruvic aldehyde in the presence of an organic acid with subsequent heat treatment.

B.P. 635,074. Appl. 21.2.47. Acc. 5.4.50.
Polymerization of vinyl compounds. Pierre Castan. To: De Trey Fréres, S.A.
Organic sulphinic acids used as catalyst for the polymerization of vinyl chloride without the use of heat. This method can be applied to polymerization of pastes in the form of tooth fillings.

B.P. 635,113. Appl. 2.2.48. Acc. 5.4.50.
Production of viscose rayon filaments. R. M. Lodge. To: Courtaulds, Ltd.
Method of producing high-denier viscose rayon relatively free from carbon disulphide.

B.P. 635,130. Appl. 17.12.46. Conv. (U.S.A.) 29.6.45. Acc. 5.4.50.
Adhesive cement compositions, composite structures employing said adhesive cement. J. M. McClellan, Jnr. To: Minnesota Mining Co.
Adhesive cement compositions based on rubbery polymers and phenol-aldehyde resins.

B.P. 635,150. Appl. 8.7.47. Conv. (U.S.A.) 19.11.38. Acc. 5.4.50.
Separation of isobutylene from hydrocarbon mixtures. Standard Oil Development Co.

B.P. 635,194. Appl. 23.3.45. Acc. 5.4.50.
Organic silicon derivatives. A. H. Stevens. Comm. from Montclair Research Corp.
Preparing organo silicon derivatives by reacting a silicon halide or oxyhalide with a halo hydrocarbon in the presence of metallic magnesium at appropriate temperatures.

B.P. 635,206. Appl. 21.3.46. Conv. (U.S.A.) 2.10.45. Acc. 5.4.50.
Synthetic Resin Compositions. Wingfoot Corporation.
Synthetic rubber-butadiene copolymers with improved physical characteristics.

B.P. 635,213. Appl. 24.6.46. Acc. 5.4.50.
Heterogeneous plastic compositions and method of making the same. T. A. Tegrotenhuis.
Material for tyre treads, etc., based on natural rubber in combination with carbon black and a polymeric material. Improved flexing properties are claimed for this compound.

B.P. 635,252. Appl. 7.8.47. Conv. (U.S.A.) 25.11.43. Acc. 5.4.50.
Gas torches for welding thermoplastic materials. Le Roy B. High and J. B. Harmon. To: Udylite Corp.
Gas-heated torch with provision for temperature control of the welding gas consists of jacketed body, which is heated externally; the welding gas passes through the centre of the body.

B.P. 635,262. Appl. 7.11.46. Acc. 5.4.50.
Thermoplastic closures for bottles, jars and like containers. E. T. Webb.
Injection-moulded thermoplastic cap with vertical serrations which form part of a thread to fit the screw thread of a bottle top, and machine for fitting same to bottles.

B.P. 635,286. Appl. 29.4.47. Conv. (U.S.A.) 30.4.46. Acc. 5.4.50.
Compositions prepared from oil-modified alkyd resins. British Thomson-Houston Co., Ltd.
Materials for varnishes, impregnation and the like.

B.P. 635,294. Appl. 4.7.47. Conv. (U.S.A.) 8.7.46. Acc. 5.4.50.
Improvements in, or relating to, polyvinyl acetals. E. I. du Pont de Nemours.
Colour-formers for colour photography based on 5-acyloxy-pyrazole amidoaldehyde acetals of vinyl alcohol polymers.

B.P. 635,310. Appl. 26.9.47. Conv. (U.S.A.) 2.10.46. Acc. 5.4.50.
Improvements in colouring cellulose ester or ether textile materials. British Celanese, Ltd.
Use of indigoid vat dyes for the colouring of cellulose ester textiles.

B.P. 635,336. Appl. 21.9.44. Conv. (U.S.A.) 24.9.43. Acc. 5.4.50.
Method of forming synthetic rubber and the products resulting therefrom. Heresite and Chemical Co.
Copolymerization of styrene-butadiene acrylonitrile compounds.

B.P. 635,375. Appl. 1.8.47. Conv. (U.S.A.) 28.10.40. Acc. 5.4.50.
Process of decorating plastics. Hoosier Cardinal Corp.

B.P. 635,470. Appl. 23.4.48. Acc. 12.4.50.
Induction heating of ferrous articles such as moulds. G. T. Collins. To: Wild-Barfield Electric Furnaces, Ltd., and British Industrial Plastics, Ltd.

B.P. 635,549. Appl. 14.5.46. Acc. 12.4.50.
Apparatus for joining thermoplastic material. J. T. G. Milne.
Variable-speed R.F. roller welder with R.F. power control dependent on roller speed.

B.P. 635,576. Appl. 18.4.47. Acc. 12.4.50.
An improved manufacture of polymers of propylene. C. Arnold. To: Standard Oil Development Co.
Selective production of low-molecular weight propylene polymers using a Friedel-Crafts type catalyst in the polymerization process.

B.P. 635,581. Appl. 29.5.47. Conv. (U.S.A.) 29.5.46. Acc. 12.4.50.
Polymerization of esters of methacrylic acid. E. I. du Pont de Nemours.

B.P. 635,645. Appl. 4.12.47. Acc. 12.4.50.
Production of organohalosilanes. A. J. Barry. To: Dow Corning Corp.

B.P. 635,657. Appl. 15.1.48. Acc. 12.4.50.
An improved electrically heated gas gun or torch. R. S. Arkless (Billingham).
Welding gun for polythene with spirally wound electric heater element.

B.P. 635,668. Appl. 24.2.48. Conv. (U.S.A.) 28.2.47. Acc. 12.4.50.
Improvements in the manufacture of cellulose esters. British Celanese, Ltd.
Filtered cellulose ester compositions suitable for moulding purposes.

B.P. 635,726. Appl. 21.7.47. Acc. 12.4.50.
Improvements relating to the manufacture of alkoxy silanes. W. Simpson. To: Metropolitan Vickers Electrical Co.
Manufacture of alkoxy silanes by the direct reaction of an aliphatic alcohol with a chlorosilane.

Books Received

"Practical Applications of Recent Lac Research." By H. K. Sen and M. Venugopalan. India: Orient Longmans, Ltd. London: Longmans, Green and Co., Ltd. 12s. 6d.

"Packaging and Display Encyclopædia; 1950." London: George Newnes, Ltd. 63s.

"F.B.I. Register of British Manufactures"—1949-50. 22nd Edition. London: Kelly's Directories, Ltd., and Iliffe and Sons, Ltd. 42s.

"Plywoods." By A. D. Wood and T. G. Linn. Edinburgh: W. and A. K. Johnston, Ltd. 40s.

"Paper Base Laminates." By S. E. Sorrell. London: Cleaver-Hume Press, Ltd. 12s. 6d.

"Boron Trifluoride and its Derivatives." By H. S. Booth and D. R. Martin. London: Chapman and Hall. 40s.

"Solvents," 6th Edition. By T. H. Durrans. London: Chapman and Hall. 21s.

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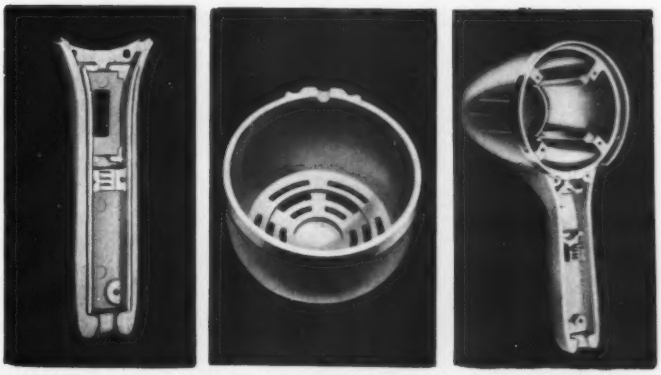
The housing for the hair-drier, illustrated above, was designed and manufactured at the request of our customer. Three moulds were made—all multi-impression—one for the main body, one for the cap, and one for the handle lid. By an interchange of pads in the latter mould, a handle can be moulded without provision for a switch, thus saving further tool costs. The fit between the three parts had invariably to be accurate (no small problem), but this created no difficulty in production. After the moulding processes, twelve holes are drilled, seven holes are tapped and three holes countersunk—all extremely accurately positioned. In spite of the qualities of the housing, it is produced at a very low cost.

Our representative will gladly call to see you upon request.



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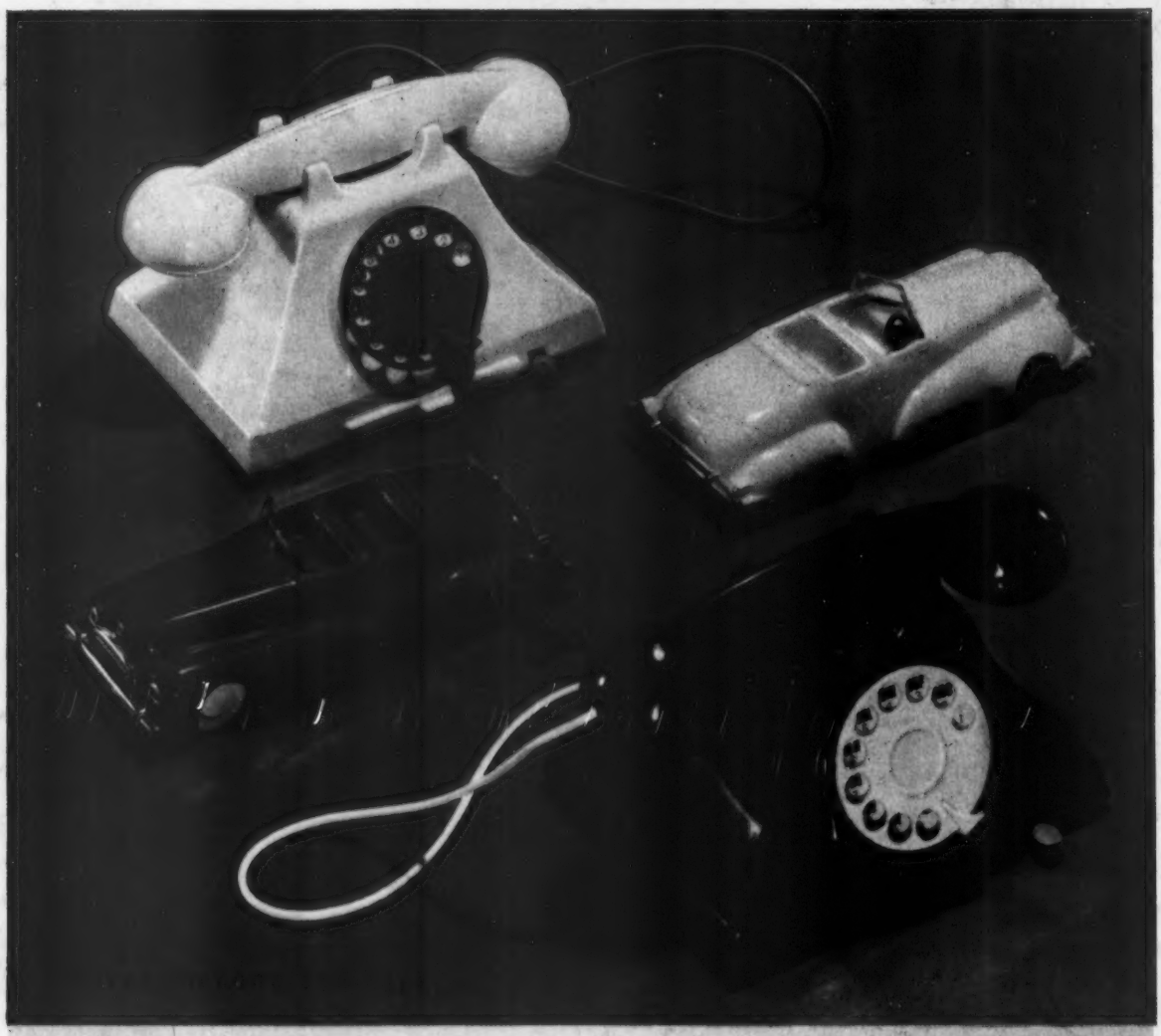

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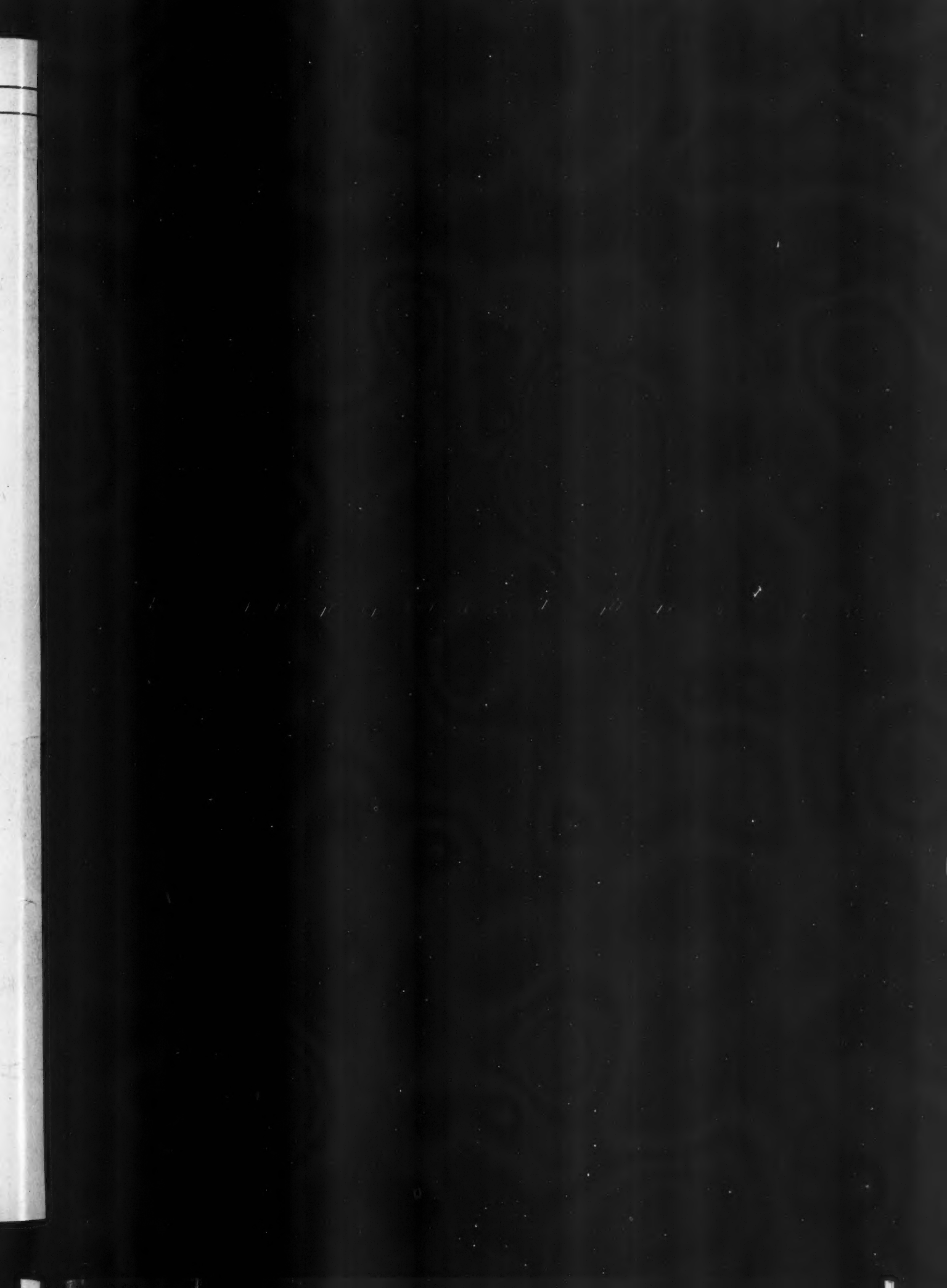
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